Products finishing

FRED W. VOGEL, Editor

Volume 6 SEPTEMBER, 1942 Number 12

Published monthly by Gardner Publications, Inc. 431 Main St. Cincinnati, Ohio

•

DON G. GARDNER President and General Manager

•

JOHN M. KRINGS
Advertising Manager
431 Main St., Cincinnati
MAin 0182

G. M. FILLMORE
342 Madison Ave.
New York
Murray Hill 6-3899

GEORGE H. MEYERS
Tribune Tower, Chicago
Superior 2290

Member

CCA

Printed in U. S. A.

Copyrighted

CONTENTS

Editorial 9

Practical Chromic Acid Anodizing..... 10
By EDWARD FINNIE

Scales, Too, Must Be Able to Stand Up and Keep Their Good Looks..... 22
By M. J. BURR

Finishing Ventilators for Liberty Cargo Ships..... 28
By FRED A. HERR

Transparent Coating Developed for Protecting Surfaces of Metal Parts..... 34
By C. G. STARK, JR.

Metal Finishers Turn to Corronizing Process..... 40
By JOHN E. HUBEL

Modern Gold Plating—Part 25..... 46
By JOSEPH B. KUSHNER

Finishing Facts 54

News of the Industry..... 58

New Plant Equipment and Materials..... 62

Opportunity Section 77

For Your Catalog Library..... 78

Index to Advertisements..... 80

More Than 16,000 Circulation This Issue

LIXOL

USED IN MANY PLANTS FOR DEGREASING

30 SECOND CLEANING

★Bushings made of brass, steel and rubber are being washed at room temperature in LIXOL with water added for 30 seconds. They are tumbled and rinsed in cold water and hot air dried. Rust is entirely eliminated and no damage caused to the rubber. LIXOL has solved the cleaning and production problems in the cleaning department of this company. LIXOL may be the answer to the cleaning and production problems in YOUR cleaning department. Write us for complete information.

★

THE COWLES DETERGENT CO.

7016 EUCLID AVE. METAL CLEANING DEPT. CLEVELAND, OHIO

IN addition to increasing our output of raw materials—and unless we increase this output we shall lose this war—we must cut out every form of waste. One of our most dangerous scarcities is the scarcity of steel, a single medium tank contains 26 tons of steel and such tanks are destroyed by hundreds in isolated actions on single sectors. Tanks are knocked out of action by the hundreds and thousands and the metal in them does not return to the mills and furnaces in the form of scrap. That is why we are renewing our drive for metal salvage, why the War Production Board has asked more than two million wholesale and retail merchants to search storerooms and shops for scrap metal.

No longer may we bask in the peace-time luxury of "the richest country in the world." We have thrown everything we own into the war, and until the war is won we must live as though we were a poor people, a people with scant resources. Just now we're so short of rubber that WPB has ordered that rubber is not to be used in making cartridge clip boxes, gun grips, and a long list of other military products for our fighting men. And production soldiers on the factory front will be uniformed in work clothes of skimpier cut, work clothes with fewer pockets, buttons and buckles.

The shortage of steel during the past month impelled the WPB to issue orders to the furniture industry to help relieve civilian shortages by making out of wood articles normally made of metal. The metal finishing industry too, although circumscribed by the many restrictions already imposed on it has been asked to seriously consider the remotest possible opportunities of salvaging vital scrap metal.

Practical Chromic Acid Anodizing

By EDWARD FINNIE
Plater Chemist, Chrysler Corporation

DUE to the fact that most articles written about the anodizing of aluminum are of a technical nature, the writer is herein concerning this article with the practical operating aspects of this process so that the average operator can, without too much trouble, proceed with the anodizing cycle with a minimum of research and care.

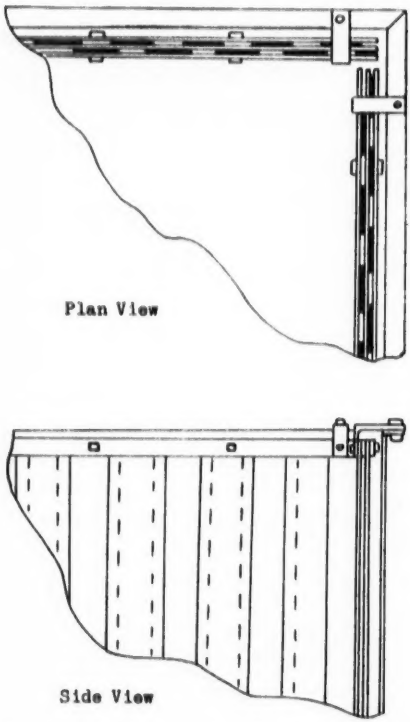


Fig. 1 — Illustration showing one advisable method of lining the side of an anodizing tank.

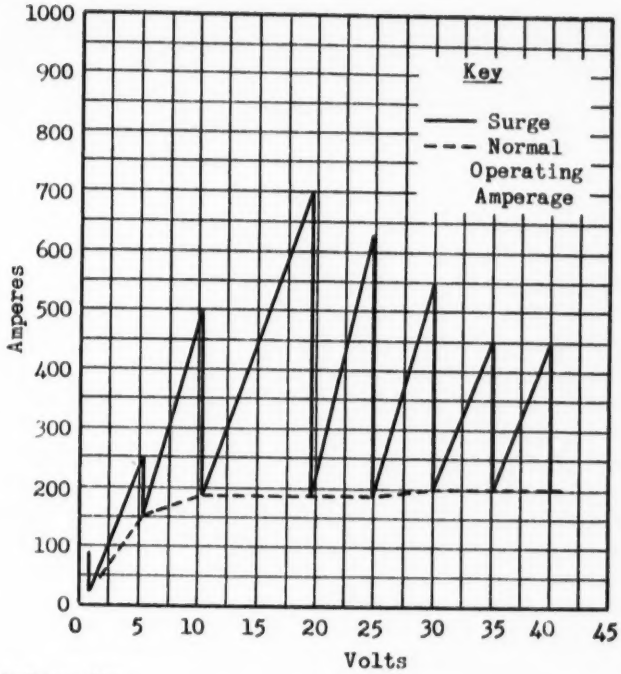
The anodizing process which is used quite extensively in aircraft production is the chromic acid type. All discussion of this anodizing cycle will conform to Government specifications because the majority of us are working directly or indirectly on either Army or Navy projects.

There are four definite purposes for anodizing aluminum and each in its own sphere is as important as the other. These are:

1—Anodizing provides a surface that is resistant to corrosion.
2—Because the hardness of the anodic coating ranges high on the hardness scales, the anodizing produces a surface that is hard and resistant to abrasion.
3—The anodic coating is an excellent dielectric and, because of its insulating properties, prevents any electrolytic action that may be set up when aluminum contacts a dissimilar metal.
4—The etched surface of the anodic coating provides an excellent base for paint.

The chromic acid anodizing process is limited in application to aluminum

Fig. 2 — Graph showing the amperage surge found in a voltage step-up of 5 volts a minute from 2 volts to 40 volts.



alloys containing less than 5 per cent of copper. Any alloy with more than 5 per cent copper must be anodized in the sulfuric acid type of bath to conform to government specifications. Extruded parts, forgings and stampings are the types of parts generally anodized.

Equipment Needed for the Anodizing Cycle

For cleaning, a steel tank equipped with heating facilities, water inflows, drainage and ventilation is necessary.

Two steel rinse tanks equipped with water inflows and drainage are necessary. The rinse tank after cleaning need have only cold water piped in; the hot rinse must be equipped with heating facilities as well and ventilation is desirable.

A steel tank is used for the chromic acid solution. This tank is made cathodic to the source of current supply; the entire tank is cathode area. The work to be coated is connected to the anodic pole of the current supply. Ventilation of the type used on chromium plating solutions is required because of the dangerous and obnoxious chromic acid fumes generated during the process.

Steel cooling and steel heating coils sufficient to cool and to heat the solution must be installed as the solution requires heat to raise the temperature to the operating temperature and because of heat generated during the process, cooling facilities must be employed to keep the temperature within the operating limits. Ordinary tap water is sufficient coolant for this purpose.

An airline to permit agitation of the solution during anodizing is required. This agitation will keep the correct temperature at the work inasmuch as the high voltage employed causes overheating at the anode.

To prevent shorts between the cathode and anode, the anodizing area must be insulated from the tank and coils. This is best performed by the suspension of wire reinforced glass strips from suitable holders at the

top of the tank and by placing strips of glass or blocks of acid-proof tile at the bottom of the tank, thus isolating the work from the tank. The glass should be spaced so that current will pass from the cathode. Figure 1 shows a foolproof method of lining the sides of the tank.

For economy of operation, a motor generator set is recommended, although rectifiers may be used. A 0-48 volt, 1,500 ampere set is sufficient for a tank 3 ft. x 6 ft. x 12 ft. The current usage per square foot is low, usually running between 1 and 7 amperes per square foot, but because of the voltage step-up from 0 to 40 or 48 volts an amperage surge is inevitable. This surge runs as high as 400 per cent more than the normal operating amperage and this additional amperage capacity must be available. Figure 2 is a graph of the amperage surge found in a voltage

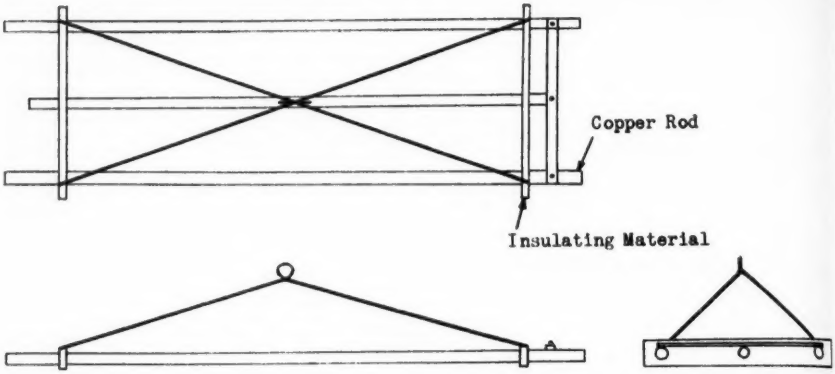


Fig. 3—One type of rack construction suggested for the anodizing operation is shown in this illustration.

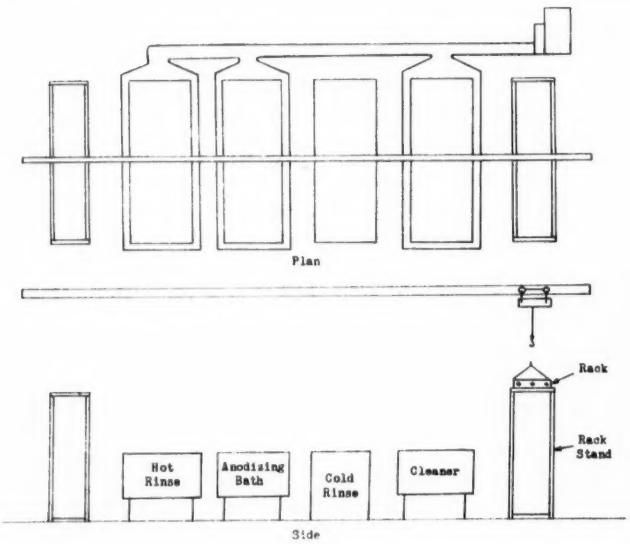
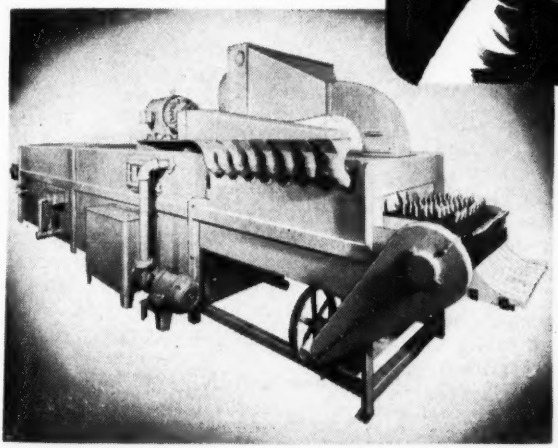


Fig. 4—This is a drawing of a recommended tank layout designed for production anodizing.

"THANKS FOR THOSE SHELLS and I'm Counting on You for More!"

"**LOOK** what we're doing with those shells we get. The Japs don't like it. But we need more shells — and quick!"

The Alvey-Ferguson Shell Washing Machine shown here was especially designed to remove grease from and dry 20 mm., 37 mm. or 40 mm. shells before loading. With automatic ejector, this A-F Machine is an integral part of a painting line in a shell loading plant.



Other A-F Machines wash and dry cartridges, bombs and shells or remove cyanide from hardened gun parts, clean machine gun barrels, etc. Write for details — The Alvey-Ferguson Co., 619 Disney Street, Cincinnati, Ohio.

CONVEYING A=F MACHINERY

ALVEY-FERGUSON
Washing Machines
FOR INDUSTRY

step-up of 5 volts a minute from 2 volts to 40 volts. While the amperage surge is momentary, it is nonetheless present and must be taken care of with enough generator capacity.

Required on Government installations are recording voltmeters and recording thermometers along with instruments for the operation of the current supply, such as voltmeter, ammeter, and so on.

Dimensions

L	Depends on tank depth.
H	Depends on distance from anode rod to solution.
B	Depends on diameter of anode rod.

Anodizing rack —

Suitable for anodizing parts up to 1/16" in thickness.

Insert part between coils of spring.

Material

1/4" dia. 1750 or 2450 aluminum wire

To make, roll wire on slow speed lathe.

After forming, heat treat at 930 deg. F. for 30 minutes, quench in cold water.

Allow springs to age harden four days at room temperature before using.

Fig. 5—Drawing showing a coil spring rack designed specifically for holding parts made of thin materials.

For production handling of anodized parts, a portable rack is first loaded at the starting point and then the rack is transferred from cleaner to rinse to anodizing to rinse and to unloading by means of an overhead hoist. This rack is constructed of steel and copper tubing and is so constructed that it will fit into electrical connections on the anodizing tank. A suggested rack is shown in Figure 3. Figure 4 is a suggested tank layout for production purposes.

Solutions

For cleaning, any suitable aluminum cleaner is used. These solutions are operated between 170 and 200 deg. F. and require no current to clean. An immersion time of from 10 to 20 minutes is usually sufficient for the cleaning operation.

The anodizing solution is a 5 to 10 per cent solution of chromic acid in water. This bath must be operated between 91 and 99 deg. F.

Analysis of the chromic acid bath, for good results, must show that the free chromic acid content is not less than 2.5 gr./100 cc; that the reduced chromium is not more than the equivalent of 0.5 per cent chromic acid; that the combined percentage of aluminum oxide and ferric oxide is not more than 0.3 gr./100 cc; that the chloride content is not more than the equivalent of 0.05 gr.Cl/100 cc.

Anodizing Cycle

1—Rack or wire stock.
2—Clean.
3—Rinse in running water.
4—Place in chromic acid bath. Start voltage at 0 volts and step up voltage 5 volts a minute until 40 volts or 48 volts are reached. Anodize at 40 or 48 volts for at least 30 minutes.
5—Rinse in hot water.
6—Unwire or unrack.

Rack and Wire Stripping

All racks and wires that go through the anodizing cycle must have the anodic coating removed before these can be used in another cycle because the anodic coating is a non-conductor of electricity.

To remove the coating, the racks and wires are immersed in a 5 oz.-gallon solution of caustic soda oper-

AUTOMATIC ANNEALING AND PICKLING EQUIPMENT FOR BRASS AND STEEL SHELL CASES AND OTHER PARTS

• Time, money and acid are saved by this new type of annealing and pickling equipment built By Curran Bros., Ltd. of Cardiff, Wales, and distributed in the United States by H-VW-M exclusively.

Replacing the usual pickling tanks, and, in some installations, expensive controlled atmosphere furnaces, the new equipment consists of an automatic spray pickling chamber, usually located at the discharge end of a gas-heated muffle furnace. Articles to be annealed and pickled are carried through both units on a conveyor, resulting in fully automatic annealing, pickling, washing, and warming for quick drying.

The pickling chamber is lined with rubber and has a number of zones, in each of which the work passes through high pressure sprays, first of acid and then of hot water. No acid fumes can emerge from either end of the chamber.

Write H-VW-M today for full details on possible applications of this equipment to your work.

HANSON-VAN WINKLE-MUNNING CO.
MATAWAN, NEW JERSEY

PLANTS • Matawan, New Jersey • Anderson, Indiana • Bridgeport, Connecticut
SALES OFFICES • Anderson • Bridgeport • Chicago • Cleveland • Dayton
Detroit • Elkhart • Matawan • Milwaukee • New Haven • New York
Philadelphia • Pittsburgh • Springfield (Mass.) • Syracuse

Manufacturers of a complete line of electroplating and polishing equipment and supplies

2789

ated at a temperature of 150 to 160 deg. F. This solution must be contained in a steel tank with ventilating facilities. The oxide coating is removed when a violent gassing is noticed at the surface of the racks or wires.

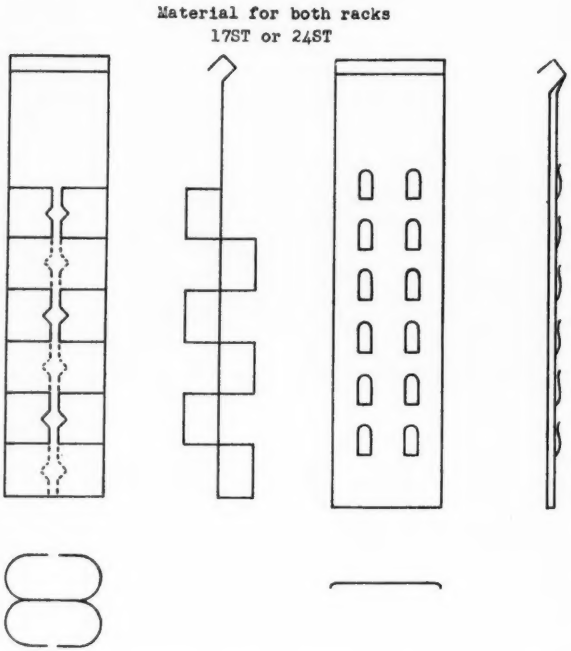


Fig. 6—This illustration shows a drawing of two types of racks that may be used for holding various sized parts.

Following the caustic soda dip, the racks are rinsed in water. To remove any smut produced on the aulminum in the caustic solution, the racks are dipped in a (1-1) solution of nitric acid. This solution may be kept in a pitch-lined wood tank or in a tank made of ceramic material. The solution is operated at room temperature and the length of time the work remains in the bath is dependent on the time it takes to remove the smut. Follow this dip with a rinse in running cold or hot water to remove acid.

Racking

All the racks and wires used in the anodizing solution must be constructed or made of aluminum because other metals such as brass or copper will dissolve in the anodizing solution and contaminate it. For wiring, 2S aluminum wire is most suitable and is generally used in either 1/32, 1/16, 3/32 or 1/8 in. diameters. Racks are generally constructed of 17ST or 24ST aluminum material.

It is necessary to provide an absolutely tight contact on parts anodized because a momentary break in contact while anodizing may cause the part to become insulated at that point and may cause burning at the work.

Racks should be constructed to fit individual needs; however, a few general racks can service a variety of parts. Figure 5 presents a coil spring rack that will carry any part made of thin material. The parts are inserted between the coils of the spring and there is sufficient tension to hold a multitude of parts.

Figure 6 shows other types of racks that may be employed for various sized parts. Small parts such as rivets may be anodized in a perforated container such as is shown in Figure 7. It is possible to nest parts together and still get a satisfactory anodized surface, providing the parts

Faster and Smoother

OVER ALL GRINDING OR SPOTTING

OF STEEL AND ALLOY PLATES, STRIP, TUBES, BARS or SHEETS and FOR FAST REMOVAL OF WELD FLASHINGS.

with an
ABRASIVE BELT SWING GRINDER
using
3-M ABRASIVE BELTS

3 TO 6 TIMES FASTER are claims made by users of this method for smooth, even grinding. Here you combine controlled stock removal features of a snagging wheel and smooth, even surface grinding features of disc grinders. The machine can be tilted to follow contours. Swing Grinders using Segment Face Contact Wheels and 3-M Abrasive Belts are free of chatter and are being adopted for speeding up war production in hundreds of plants.

If you are grinding welded tubes, gun mount sections, armor plate, steel and alloy strip, bars or sheets, or are grinding and removing scale or surface imperfections, may we have our sales engineer call and explain in detail how this 3-M Method will help you.

Swing Grinders are manufactured by The Jones Engineering Co., Elwood City, Pa.

SEND FOR THIS BOOKLET THAT GIVES COMPLETE INFORMATION AND TELLS HOW TO SPEED UP PRODUCTION IN GRINDING AND FINISHING DEPARTMENTS.

Name_____

Company_____

Address_____

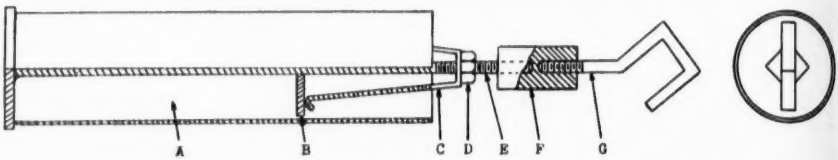
City_____ State_____ PF942

MINNESOTA MINING & MFG. COMPANY

SAINT PAUL MINNESOTA

MFRS. OF 3-M PRODUCTS 3-M Abrasive Paper and Cloth Products—"SCOTCH" TAPES 3-M Elastic Cements — 3-M Wax and Sealer — 3-M Lapping and Grinding Compound — 3-M Cutting and Finishing Compound — 3-M Roofing Granules

are separated by the thickness of a wire. Figure 8 illustrates how parts may be bundled together.



To load, disassemble F, G, D, C, B from E, fill area A with small parts, add B and C, tighten nut D until there is a minimum of loose parts, add F and G, and run through anodizing cycle.

Construct rack so that threaded parts do not receive the anodic coating. The dimensions will depend on the anodizing equipment. Construct of aluminum alloy.

Fig. 7—Drawing showing the design of a perforated basket for holding small parts such as rivets.

Evaluation of the Anodic Coating

A test for a satisfactory coating is to stamp the finished part, using a rubber stamp, with an aniline violet ink. Allow to dry for a few seconds, then rub with a clean, dry cloth. If an ink stain remains after the surface has been rubbed, the anodic film is satisfactory. If the ink is removed, the film is unsatisfactory.

A better and surer test is performed by reworking a flashlight so that flexible wires are attached to the poles of the batteries. If, on touching an anodized part with the wires, the flashlight burns, the coating is not fully insulated and thus is unsatisfactory. If the light does not burn, the coating is fully insulated and is satisfactory enough to pass a salt spray test.

Maintenance of the Anodizing Bath

To maintain an effective solution, some method of control is needed and a few methods of shop control are available which are fairly reliable.

One method of control is the utilization of a recording ammeter. This meter will register the constant minimum amperage throughout the process. As long as the current density remains between 3.5 and .9 amperes per square foot, a good deposit is obtained. If the current density falls below .9 amperes per square foot, additions of chromic acid should be made. If, after a long period of operation, additions of chromic acid based on the above figures do not raise the current density, the solution should be discarded and a new solution built up. A satisfactory coating may be obtained when the current density is above 0.9 amperes per square foot.

Another method of chromic acid additions concerns the

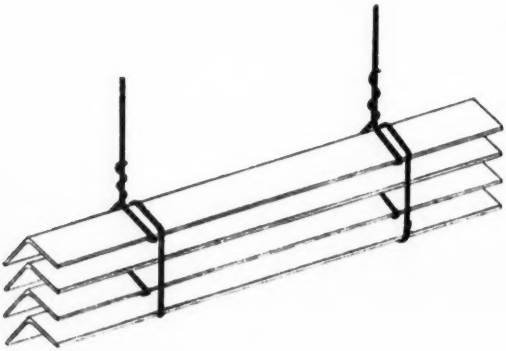


Fig. 8—Parts may be nested together in the manner shown in this drawing.

RECTO-PLATERS

for Anodizing

SULPHURIC OR CHROMIC ACID PROCESSES

If your war materiel contract calls for anodizing by either the chromic or sulphuric acid method, be sure to investigate the advantages of the Udylite-Mallory Rectoplater.

RECTOPLATERS ARE QUICKLY AVAILABLE. We can make prompt shipment from stock.

A WIDE RANGE OF AMPERE-VOLT COMBINATIONS CAN BE SECURED. By grouping single Rectoplater units in series, practically any anodizing requirement can be filled.

RECTOPLATERS HAVE HIGH CONVERTIBILITY VALUE. When the present need subsides, the Rectoplater anodizing set-up can be broken into individual units for such purposes as barrel and still tank plating, electrocleaning, etc.

We are equipped to design and supply complete anodizing installations. Udylite's experienced engineers will be glad to help you with your metal finishing problems.

THE UDYLITE CORPORATION

1651 E. Grand Blvd., Detroit, Mich.

Chicago
1943 Walnut Street

Long Island City, N. Y.
11-16, 44th Drive

Cleveland
4408 Carnegie Ave

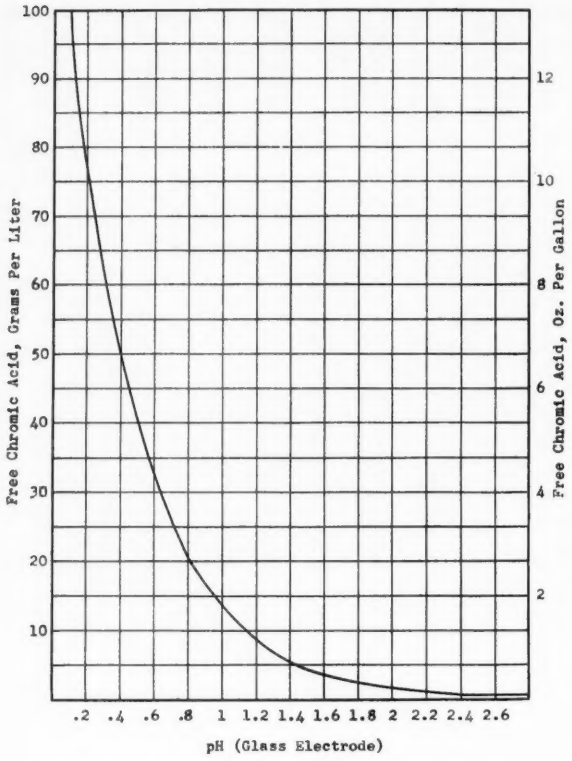


Fig. 9—This graph shows pH readings and the comparative free chromic acid present in oz. per gallon.

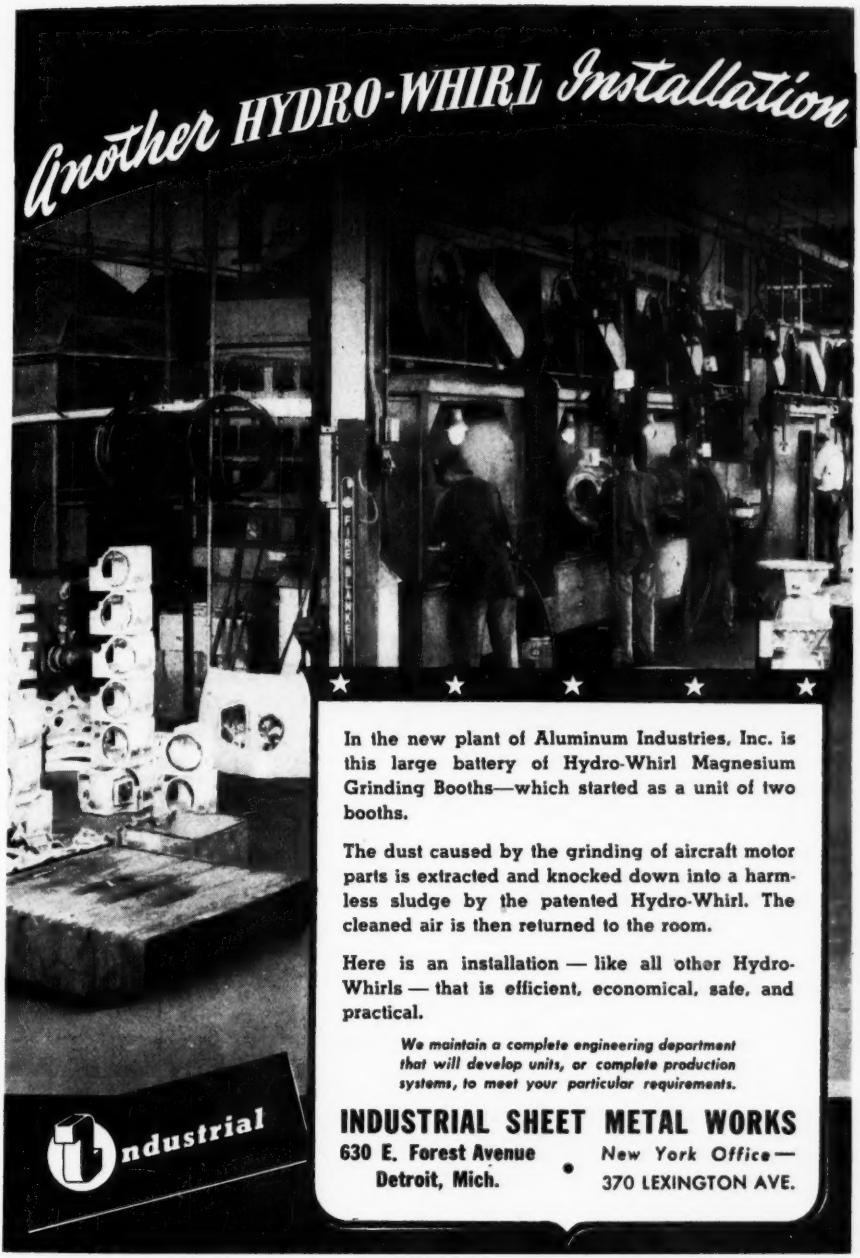
use of an ampere hour meter. Add 100 pounds of chromic acid for each 35,400 ampere hours of use as registered on the meter. The use of a pH meter to control the bath has possibilities. It is suggested that the pH of the chromic acid anodizing solution be held below .9 as measured on a Beckman glass electrode pH meter. Figure 9 shows a graph of pH readings and the comparative free chromic acid in oz./gallon.

The bath can be maintained by the use of the pH meter and by the use of a Beaume hydrometer. Roughly, a hydrometer reading 5 deg. at 60 deg. C. will correspond to a 5 per cent solution and 10 deg. Beaume will correspond to a 10 per cent solution of chromic acid. Using the hydrometer and keeping the solution between 5 and 10 deg. Beaume by removing some of the solution when the reading gets too high and replacing with water and by keeping the ph of the solution about .7 or .8 by additions of chromic acid will give the operator a bath that will operate satisfactorily with a minimum of trouble.

M.S.A. Defense Bulletin No. G-5. Essential emergency safety equipment for plant protection and safety departments is completely described in an eight-page, fully illustrated Defense Bulletin No.G-5 issued by Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh, Pa. The bulletin, covering a complete range of safety equipment for wartime conditions, features on the cover a suggested grouping of essential items at strategic locations in plants. Inside pages include descriptions of gas masks, helmets, gas detectors, inhalators, asbestos suits, goggles, respirators, first aid kits, stretchers, splints, fire blankets, and so on.

In addition, the bulletin introduces three new special items—the M.S.A. Steel Helmet for plant guards and repair squads as well as air-raid service squads, the M.S.A. Defense First Aid Belt which contains a large supply of essential first aid materials, and the M.S.A. Combination Traction Splint for use in supporting fractured arms and legs. Copy of Bulletin No. G-5 free upon request.

Another HYDRO-WHIRL Installation



In the new plant of Aluminum Industries, Inc. is this large battery of Hydro-Whirl Magnesium Grinding Booths—which started as a unit of two booths.

The dust caused by the grinding of aircraft motor parts is extracted and knocked down into a harmless sludge by the patented Hydro-Whirl. The cleaned air is then returned to the room.

Here is an installation — like all other Hydro-Whirls — that is efficient, economical, safe, and practical.

We maintain a complete engineering department that will develop units, or complete production systems, to meet your particular requirements.

INDUSTRIAL SHEET METAL WORKS

630 E. Forest Avenue
Detroit, Mich.

•

New York Office—
370 LEXINGTON AVE.

Industrial

Scales, Too, Must Be Able to Stand Up and Keep Their Good Looks

By M. J. BURR

Metallurgist, Toledo Scale Company, Toledo, Ohio

"LUSTROUS," "durable," "rust-resisting," "black lacquer" are words frequently used by the men who sell the products of the Toledo Scale Company, Toledo, Ohio, since they describe the finish on the company's industrial scales. Like any other piece of equipment subjected to constant usage, a scale must be able to stand up and "take it," not only in quality and stamina of its parts, but in the durability of its finish to

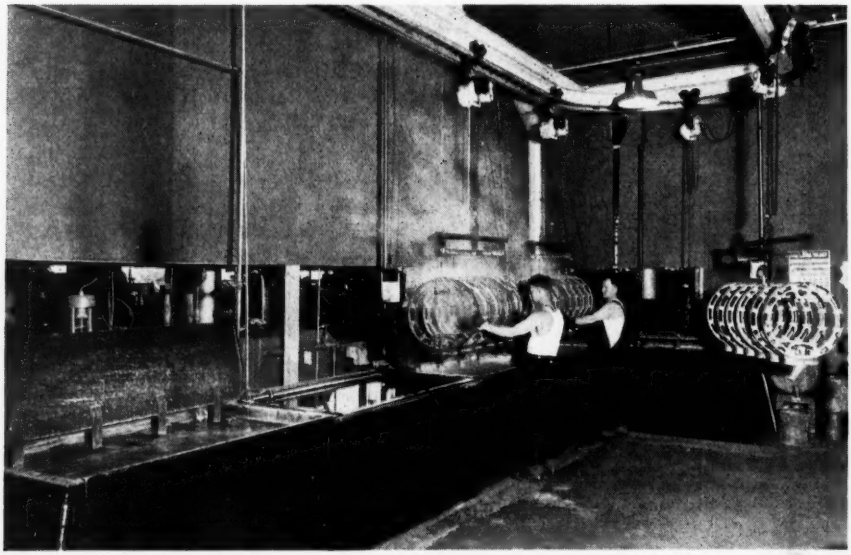


Fig. 1—Illustration showing Bonderizing department.

ward off abuse and maintain a good appearance.

Long ago Toledo Scales joined the lengthening list of industrial products, the surfaces of which are protected from the ravages of rust and corrosion by the Bonderizing process —the chemical conversion of metallic surfaces to a non-metallic phosphate coating of the proper texture adapted to the inhibition of corrosion and greatly to increase the adhesion, and hence the durability of any paint finish that may be applied.

Scales, it may be noted, are no longer confined to the duties of merely weighing products sold over the counter, or those passing through the wholesale and jobbing outlets, or the weighing of large quantities of coal, hay, ore, and the like, or even livestock. The scale has actually become an important piece of industrial manufacturing equipment. When one thinks of industrial equipment that "gets around a bit," the scale or weighing device, confronts one everywhere and finds a place well up towards the top of the list.

As commerce and industry have advanced through the centuries, so has grown the demand for greater speed and accuracy in weighing—for scales that will perform a constantly increasing number of jobs. In the gigantic war program in which American industry is now engaged, fast production demands highly accurate control. Whether it is aircraft propeller balancing, automatic proportioning of gunpowder, parachute weaving, force measuring, automatic food packing, or score of other phases of production, weighing machines are answering the call for accurate and speedy control duty.

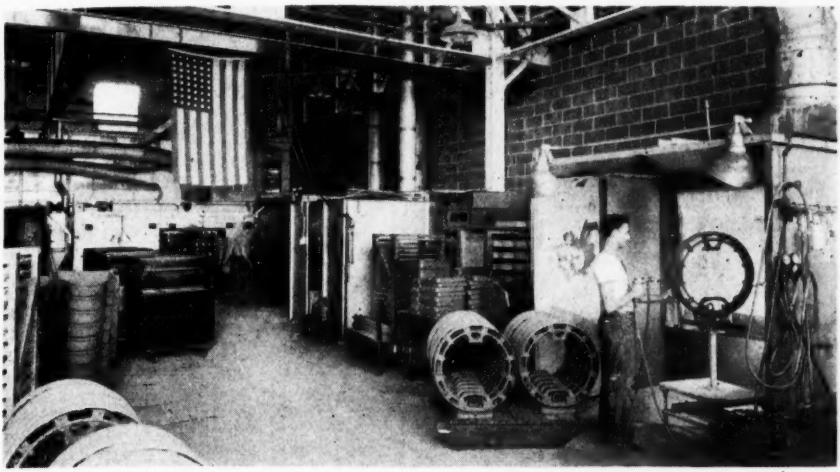


Fig. 2—The operator shown in this illustration is spraying scale dial heads with zinc chromate primer.

Years of engineering research and experience in the design and manufacture of automatic weighing equipment, have produced the wide range of standard models of Toledo Automatic Scales, and the specialized Toledo Weighing Systems for specific industries.

As the different parts pass through the chemical baths in the plating de-

partment, removing oil, grease, and dirt picked up during handling in the various machining and heat treating operations, such pieces as scale bases, heads, housings, and so on, which are to receive finish coats, are routed as it is taken from the last tank; thin sheets, however, are passed through a drying oven. As soon as dry, the work is given a coat of zinc chromate base primer in the department shown in Fig. 2, and baked for

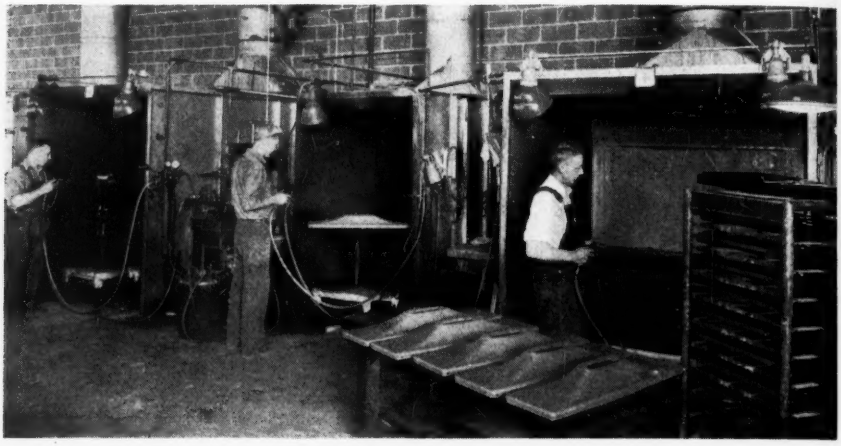


Fig. 3—A view of the enemaling department where workpieces are being sprayd with black lacquer.

through the Bonderizing department shown in Fig. 1. Here the parts, suspended from hoists traveling on an oval overhead trolley, are moved along manually from tank to tank, arranged in an L-shaped line-up, each tank being 5 ft. long, 3 ft. wide, and 5 ft. deep.

The first tank at the base of the L contains a mild caustic cleaning solution for removing any remaining traces of dirt or grease. Following along the long side of the L is a hot water rinse tank; then the Bonderite tank, operating at 180 deg. to 200 deg. F. Following this comes a cold water rinse, and finally another of hot water acidulated slightly with chromic acid. The complete treatment usually requires from three to five minutes.

Most of the work will dry quickly an hour at 300 deg. F. In this condition work can be stocked to await whatever final finishes may be required for the particular item, or as in the case of some castings, may be sent to the machining department for boring of necessary holes.

When castings again come into the finishing department for final applications, they are glazed with an oil base glazing compound to fill any pit holes or smooth over roughened spots. An overnight drying follows, after which they are sanded to a smooth surface and given another coat of zinc chromate, as shown in Fig. 3. This is followed, after a one-hour drying period, with two spray coats of black lacquer shown being applied in Fig. 4, with a one-hour drying period between the coats. Tests made in salt brine baths have demonstrated that

DU-LITE--The Finish That Can Take It

The arms in the above illustration are Du-Lite finished. This is a finish that can take it. Du-Lite stands up under severe use and exposure.

Soft and hard steel may be finished with Du-Lite and the processing does not change the dimensions or the characteristics of the steel treated.

Du-Lite service men supervise installation of equipment and train your own men to handle your steel finishing work in regular production.

Send us samples of your product for finishing. No obligation.

DU-LITE CHEMICAL CORP.
MIDDLETOWN, CONNECTICUT

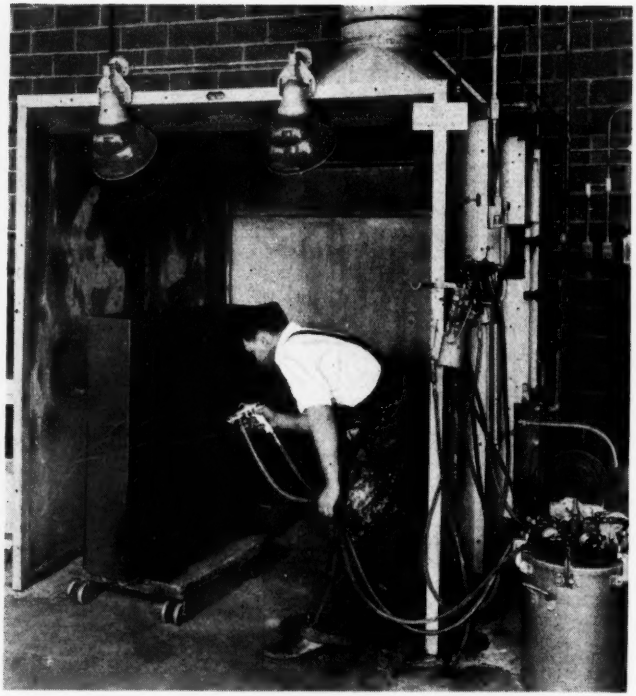


Fig. 4—This operator is spraying a cabinet base of the type used on some models of platform scales.

●

In applying the finish to this type scale, the same zinc chromate primer is sprayed and baked on, followed by a glaze application and a sanding. A night-dry oil base coat is sprayed on and baked one hour at 250 deg. F. The casting is then spot puttied and finish sanded, and given a single coat of sanding color, then instead of the two coats of aluminum with a final coat of clear lacquer, they now receive, owing to war restrictions, two coats of grey baking enamel.

this finish of two zinc chromate bases, a glaze, and two coats of lacquer over the Bonderizing casting withstood more than 1,000 hours of immersion, showing no noticeable effect on the casting.

For the baked enamel finish, used on the Plaskon scale bases, the same primer and glazing coats are applied, followed by a second zinc chromate base coat baked on, after which two coats of black baking enamel are sprayed on and baked at 250 deg. F. for a period of two hours. What is known as "the brine scale finish" is applied to one model designed for the artery pumping method of curing hams. Simplified reading features on the scale enable the operator to determine accurately the correct amount of brine to be injected.

Hard Chromium Plating. This 16-page data bulletin now being issued by United Chromium, Inc., 51 E. 42nd St., New York, N. Y., summarizes the applications where industrial chromium plating saves materials and man-hours in the production and maintenance of metal products. It gives specific examples of how production rejects and metal-working tools are being salvaged; how the service life of tools, gauges, wearing parts, and so on, can be greatly increased, and how hard-to-get equipment parts and tools are being reclaimed when worn.

The bulletin also offers suggestions on how existing plating equipment can be converted to "hard" chromium plating for war production—or how this work can be obtained through competent job plating shops. Copy of Bulletin No. 31 will be sent free upon request.

PARTS COME CLEAN

QUICKLY . . . EASILY . . . COMPLETELY

. . . *with*

SUN SPIRITS

Just a few dips . . . and Sun Spirits penetrates the minute pores of the metal . . . cuts oil, grease and dirt. Parts come out sparkling clean, ready for the next operation. Sun Spirits makes metal cleaning quick . . . easy . . . efficient—requires no mixing, no elaborate equipment.

If you are faced with a metal cleaning problem or the need for substituting for more expensive, "hard-to-get" solvents, try Sun Spirits. You'll find they can be used to replace many other solvents now almost impossible to obtain. Call in a Sun Oil Engineer—one of those Doctors of Industry—let him show you how you can save and conserve with Sun Spirits. And for factual proof of what proper engineering service has achieved, write for your free copy of "Helping Industry Help America."

SUN OIL COMPANY • PHILADELPHIA

In Canada: Sun Oil Co., Ltd., Toronto

SUNOCO

SUN PETROLEUM PRODUCTS

HELPING INDUSTRY HELP AMERICA

Finishing Ventilators for Liberty Cargo Ships

By FRED A. HERR

APPLICATION of the metal finish to the thousands of cowl ventilators being manufactured by the Weber Showcase & Fixture Company, Los Angeles, for installation on 10,000-ton Liberty EC-2 cargo ships currently under construction in shipyards on the Pacific, Altantic, and Gulf coasts represents one of the largest undertakings of that character in the Los Angeles area.

The ventilator cowls for which finishing operations are required are produced in eight sizes and shapes in the Weber Company's plant at 5700 Avalon Blvd. A view of these ventilators prior to the application of a finish coating is shown in Figure 1. The units measure from 4 ft., 4½ in., to 8 ft., 6½ in., in height, and from 20 to 72 in. in diameter. The largest, made of 14-gauge steel, weigh 400 lbs. each.

Until July of this year, the ventilator units were turned out by a combination of pressing, riveting and hammering. A huge drawing press installed in July—reported to be the largest drawing press in the world—now forms one half of a ventilator cowl in a single operation. The two halves are then welded together to form the complete unit.

The metal finishing of the ventilators is sub-contracted by the Weber Company to two Los Angeles firms. The cowls are transported by truck to the plant of the Commercial Sand Blast Company, 2628 East 26th Street, for a pre-finishing sand-blast treatment, inside and out as shown in Figures 2 and 3. This op-

Fig. 1—View showing a batch of more than 100 cowl ventilators receiving finishing touches prior to final finishing

TO SERVE AMERICA'S WAR EFFORT

More Effectively

MANUFACTURING • SALES & SERVICE

OF

RACKOTE

PLATING INSULATIONS

now combined as

THE RACKOTE DIVISION

OF

WYANDOTTE PAINT

PRODUCTS CO.

COMBINING and enlarging our sales and manufacturing facilities permit us to meet the increasing demand for RACKOTE INSULATIONS and to serve your plating insulation needs more effectively. Whatever your plating insulation requirements are, there is a RACKOTE product to do the job for you. *Write for Literature.*

THE RACKOTE DIVISION

WYANDOTTE PAINT PRODUCTS CO., WYANDOTTE, MICHIGAN

Fig. 2 — Sandblasting the interior of a Liberty Cargo Ship cowl ventilator

eration is designed to remove scale from seams that have been welded. From the Commercial Sand Blast Company's plant the ventilators are trucked to the shop of the Western Galvanizing Company, 2554 East 25th Street, where the zinc coating is applied.

Although the total number of ventilator cowls handled by these firms may not be disclosed, they total several thousand per week and represent the majority of all such ventilators being fabricated in American plants.

The huge volume of units going through has made it necessary for the Western Galvanizing Co. to handle the contract on a mass-production, assembly line basis. Cleaning, pickling, acid and final-bath tanks are installed so as to reduce handling operations to a minimum. The heavy ventilators, arriving by truck, are swung down by crane to the first cleaning tank and then are passed along on the crane from one tank to the other until the galvanizing tank is reached. Distance between the tanks nowhere is more than ten feet which, considering the size of the units being handled, is regarded as an exceptionally compact set-up.

The ventilators are dipped first into a Kelite degreaser tank which is held at 180 deg. F., and is followed by a hot water rinse at a similar temperature. Prefinishing operations include dipping into an acid pickling solution, for which a 36 ft. long tank is pro-

Fig. 3 — This illustration shows a view of the external sand-blasting operation on a cowl ventilator.

PENNSALT CLEANER

On U. S. Army tanks, the rims of the "bogie wheels" are brass-plated before their rubber "shoes" are put on. If the brass-plating is unsatisfactory, a poor rubber-coating job results.

A manufacturer had the problem of stripping unsatisfactory brass-plating from the tank rims. He was using a boiling chromic acid bath, but the job took an hour and entailed considerable evaporation of the acid. Since chromic acid is on priority, he wanted to speed up the operation in order to conserve this critical material.

A Penn Salt representative saw that a Pennsalt Cleaner could help. Result? The Pennsalt Cleaner stripped the brass in one-fourth the time formerly required, and cut down the time in chromic acid to *one-fifteenth*, thus effecting a substantial reduction in the chromic acid lost by evaporation. It did everything the customer needed, from a brass-removing standpoint, and subsequent re-plating of the rims was entirely satisfactory.

This was a tough problem to solve, but Penn Salt engineering, backed by the complete line of Pennsalt Cleaners, was equal to the task. In the family of Pennsalt Cleaners, there is at least one which will facilitate some metal cleaning operation in your plant. Let the Penn Salt technical staff help you with your problem. Phone or write to Pennsalt Cleaner Division, Dept. P.

PENNSYLVANIA SALT MANUFACTURING COMPANY

Chemicals

1000 WIDENER BUILDING, PHILADELPHIA, PA.

NEW YORK • CHICAGO • ST. LOUIS • PITTSBURGH • WYANDOTTE • TACOMA

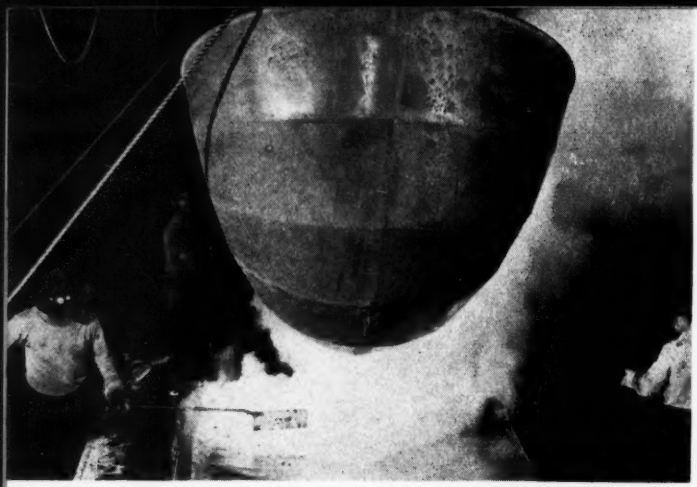


Fig. 4—This ventilator unit is being lowered by means of a overhead crane into the galvanizing bath.

vided, followed by a muriatic acid bath dip.

A zinc coating is used for the finishing operation. The coating is applied by immersion into a bath of molten metal heated to a temperature of 850 deg. F. as shown in Figures 4 and 5. The bath is maintained at that temperature 24 hours a day. Government specifications require the coating to be "... not less than two ounces per square foot," equivalent to about 1/64th-inch. A tank 13 ft. long, 6½ ft. wide, and 5 ft. deep is used for dipping the largest ventilators. Several smaller tanks are available for dipping other sizes. The largest tank has a capacity of 85 tons of molten zinc which, by government specifications, must be "... upwards of 99-8/10th per cent pure."

The grilles which fit into the mouths of the ventilators are also coated by the dipping process in the same solution. Dipping is resorted to because it has been found to be a faster and less expensive method than spraying.

Cleveland Crane Graphic Vol. 1, No. 1, an eight-page interesting bulletin now available from The Cleveland Crane & Engineering Co., 1111 E. 283rd St., Wickliffe, Ohio, illustrates and describes the use of various Cleveland Tramrail systems in warehouses, foundries, arsenals for use in loading shells, plants for die storage and handling, sheet handling, and so on. Steelweld Bending Presses and some of their applications are also treated in the bulletin, copy of which can be obtained free upon request.

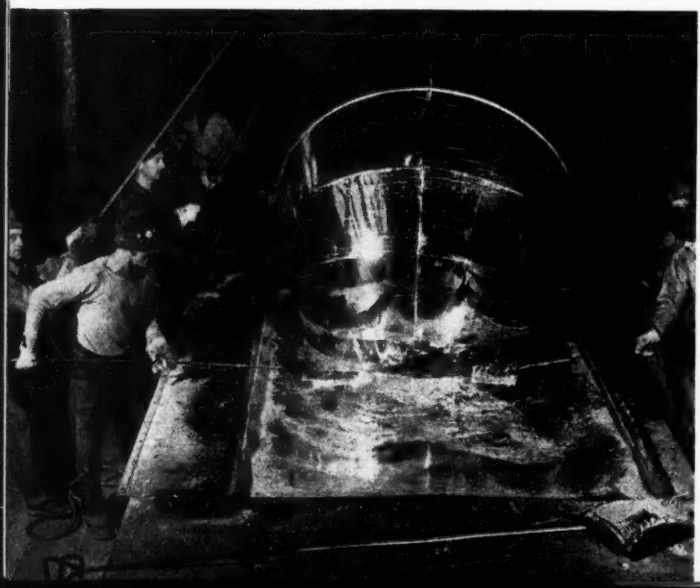


Fig. 5 — Removing a ventilator cowl from galvanizing bath. Largest of the galvanizing tanks used for this operation has a capacity of 85 tons of solution.

ELIMINATE *Source of Waste*
AT START OF PRODUCTION

★ NEW IMPROVED METHODS AND COMPOUNDS PERFECTED BY MAC DERMID FOR VICTORY PRODUCTIONS

Anodex for STEEL. New, rapid action, reverse current process and special compounds for Steel shell cases, engines and small ferrous metal products.

Metex and METEX AERO COMPOUNDS. Compounded especially for Victory productions—faster acting, safer and surer for cleaning brass, alumnum and alloys.

Solutex EMULSON CLEANER. A different kind of degreaser solvent substitute for use in spray and rotary washing machines.

AMPLE SUPPLIES • FREE TECHNICAL SERVICE

SALES AND SERVICE from COAST TO COAST
New York Cleveland Los Angeles
Chicago Detroit St. Louis
Newark Philadelphia
Toronto, Canada

MAC DERMID
INCORPORATED
WATERBURY, CONNECTICUT

Transparent Coating
developed for
Protecting Surfaces of Metal Parts

By C. G. STARK, JR.

EVEN when the of best care is exercised in the handling of fabricated metal marring, denting, and chipping is practically unavoidable. Workmen can be taught all the rules of careful handling and yet even with the most careful study and practice, the skilled man as well as the unskilled will sometimes be negligent with the result that an excessive amount of the work will not pass inspection. When production is raised to its highest peak as is the case in many plants engaged in war work today, the previously insignificant matter of production losses due to rejections becomes a highly important factor.

In addition to the matter of rejected parts due to improper handling, the factor of corrosion enters into the picture. Where production is increased or one form of operation is converted to another, often bottlenecks develop which require the storing of workpieces until they are ready for additional fabrication or actual use. While in some storage places the parts are exposed to moist atmosphere, which is readily conducive to corrosion, the worst nuisance encountered in the storage of finished parts is dust.

Then too in many shops, highly polished metal which is subjected to fabrication operations by means of dies is susceptible to scratches and die marks which are sometimes difficult to eradicate. A solution to the problem of the marred workpieces as well as to the susceptibility to corrosion or the scoring of parts subjected to drawing or stamping

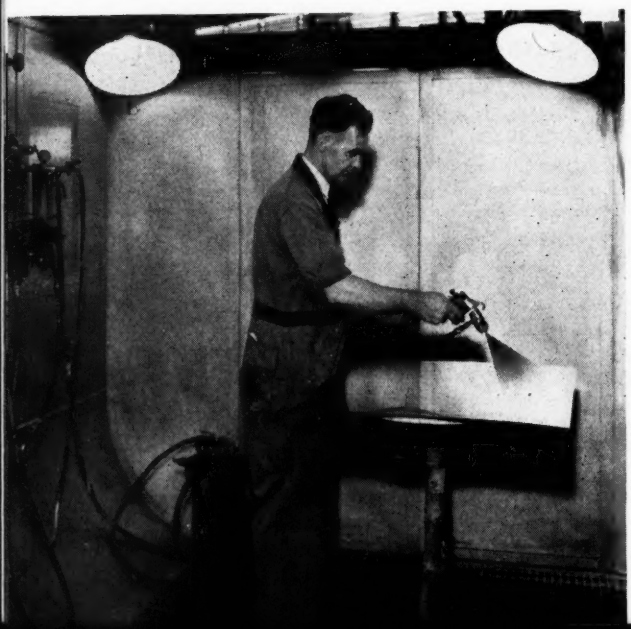


Fig. 1—This illustration shows a workman spraying a transparent film of Protektol on a flat metal surface.

Speed Up Finish Baking
ON WAR CONTRACTS
DESPATCH
CONTINUOUS CONVEYOR FINISH BAKING OVEN
Another Despatch continuous conveyor oven system for finish baking ordnance and munitions items. . . This speedy and efficient finish baking oven is typical of equipment used for processing bombs, shell cases, grenades, anti-tank mines, gas masks, motor castings, medical corps equipment and other items for war which require rapid and large scale production. Despatch has pioneered improved finish baking systems for 40 years. They have developed many standard models listed in Bulletin No. 51-L that may be delivered quickly. They have also developed many special material handling units to fit every finish baking job which requires speed, quality.
Write or Phone for a Despatch engineer. He can recommend a Despatch oven system that will fit your plant.
DESPATCH
OVEN COMPANY MINNEAPOLIS, MINNESOTA

Fig. 2—A transparent protective coating can be applied to practically all sizes and shapes of workpieces

operations apparently has been found in the devlopment of a transparent protective coating by the technicians of the Ault & Wiborg Corporation.

You Can See Through It

The coating, to be known as Protektol, is unique in that it is completely transparent, thus permitting visual inspection of the coated workpieces. It is particularly applicable to highly polished surfaces, either on flat pieces as shown in Fig. 1, or on irregular shapes and objects as shown in Fig. 2. Although these illustrations show the coating being sprayed on by the use of a spray gun, the coating can be applied by brushing, dipping, or roller coating as well.

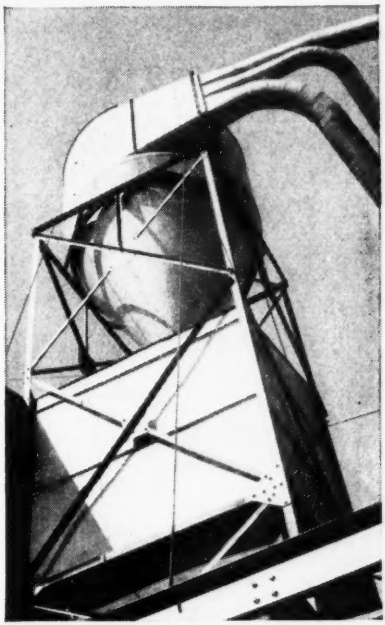
Following application by means of any one of the aforementioned methods, the coating can be air dried to leave a tough, flexible, glass-clear film of from .001 to .0015 inch thickness. According to the technicians who developed this material, one gallon sprayed to a thickness of one mil will cover approximately 250 square feet of surface. To increase production speeds, the material may be force dried for six to eight minutes at 200 degs. F.

To remove the temporary coating from the work to which it has been applied, it is necessary merely to lift one edge by means of the fingernail as shown in Fig. 4 and proceed to peel it off. If compressed air is available the coating

Fig. 3—The transparent protective film can be removed by means of compressed air which is injected under the surface through a pin hole made in the coating.

KIRK & BLUM

DUST CONTROL SYSTEMS *help industry maintain peak production*



Now, more than ever, industry must be free of all shackles — especially dust-laden air. Nothing should interfere with the effort for greater production. That's why a large war production plant, making machine tools, recently installed this Kirk & Blum Dust Control System in its enlarged pattern shop.

This entire new system, to clear the air of dust and collect shavings, was installed without interfering with machinery set-up and without loss of production time. An interesting feature of this installation is the location of the shavings and sawdust storage bin between two buildings to permit truck passage for gravity loading.

Kirk & Blum Dust Control Systems are doing similar jobs—effectively and economically—in many war and civilian industries. Men, machines and materials are protected from dust. Working conditions are improved and costs are reduced.

Why not consult Kirk & Blum Engineering Staff today? A survey of your plant can be made, without obligation, and recommendations submitted for your consideration.

THE KIRK & BLUM MANUFACTURING CO.
2816 SPRING GROVE AVE. CINCINNATI, OHIO

SEND FOR ANY OF THE FOLLOWING BOOKLETS:

"Dust Collecting Systems in Metal Industries"
"Fan Systems for Various Industries"
"Industrial Ovens"
"Blower Systems for Woodworking Plants"
"Cooling Systems for the Glass Industry"
"Data on Kirk & Blum Production Facilities"

Fig. 4—The transparency of the protective coating is demonstrated in this illustration.

can be blown off by means of a small jet of air as shown in Fig. 3. In this latter case, a pin hole is made in the coating near the center of the object to which it has been applied and the tip of an air nozzle is brought into contact. The prepressure of the air forced through the pin hole raises the coating which then can be removed manually or completely blown off. The formulation of the Protektol is controlled by the manufacturer to meet the problem set up by the surface to which the coating is applied, thus insuring adequate adhesion and eliminating the possibility of accidental or premature removal.

Protektol is said to be water-resistant, and sunproof and unaffected by mineral oils and greases. No deterioration or cracking has been noticed at temperatures between zero and 200 deg. F. This coating is said to be an excellent temporary identification film, since in addition to being furnished in the transparent form, it is also available in a variety of transparent colors.

After being removed from the surface to which it has been applied, Protektol may be reclaimed by reducing it to a liquid form again. This process is said to be very simple and may be repeated again and again, thus lowering the cost of application to a minimum.

Westinghouse Maintenance Hints Notebook. A handy notebook containing rules and suggestions concerning the care of electrical apparatus has been prepared by the Westinghouse Electric & Mfg. Co. The notebook, which is divided in two volumes, includes a total of 220 pages which are separated into 15 chapters.

Volume I covers the inspection of electrical apparatus, insulation materials and applications, the cleaning, drying, and testing of insulation, commutator maintenance, starting and regulating, of a.c., d.c., and squirrel cage induction motors. All necessary information for the proper maintenance of insulation and motor is given, with diagrams, tables, and charts included to make the text easy to follow.

Volume II is devoted to contactor maintenance, the inspection of transformers, and a chapter on transformer connections. A number of wiring diagrams embrace all of the more common connections for two and three phase, 25 and 60 cycle power transmission.

Copy of notebook will be sent free to maintenance men addressing a request to the Westinghouse Electric & Mfg. Co., Dept. 7-N-20, East Pittsburgh, Pennsylvania.

Goodrich Industrial Rubber Conservation Pamphlets. Prepared in a vest pocket size format so they will be easy to carry, the first four of a series of six pamphlets on "How to Get the Most

Service Out of Industrial Rubber Products" has recently been published by The B. F. Goodrich Company, Akron, Ohio. The series is designed to assist in the tremendous program of rubber conservation now made necessary by war developments.

All four of the first series of pamphlets treat belting: No. 1, "Transmission Belting;" No. 2, "Conveyor Belting;" No. 3, "V-Belt Drives;" and No. 4, "Belt Salvage." All will be furnished free upon request or they can be requested by individual number and title.

Each of the subjects is subdivided into chapters dealing with the various angles of the topic, and is written in non-technical language so that shop foremen or maintenance men without formal technical education can understand how to best maintain and conserve the precious rubber products now in their plants.

The company suggests that when the original booklet is received, copies be made of the text and distributed to all concerned with conservation of industrial rubber products or that enough to meet these requirements be requested. If no figures are given on the number of copies desired, the company will send only one on each request.

New Fire Extinguishing Poster. A three-color poster showing the correct method of using carbon dioxide, water and foam, and vaporizing liquid fire extinguishers, and the hazards for which each type is suited has just been brought out by Walter Kidde & Company, manufacturer of fire extinguishing and inflation devices, and will be distributed to manufacturing and industrial plants throughout the country.

Printed in red and black, the new poster was especially designed for plant display to instruct inexperienced workers in the best methods of fighting accidental or incendiary fires. Each of the three major types of extinguisher is taken up individually. Hazards for which it should be used are stated clearly and concisely, and the method of operation is explained through text and pictures.

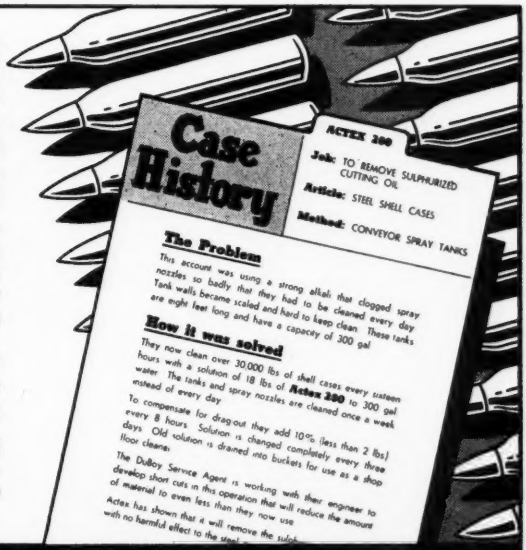
Copies of the new poster can be obtained without charge by writing Walter Kidde & Company, 140 Cedar Street, New York City.

Our soldiers, sailors, and marines need planes, ships, tanks, ammunition, uniforms, and food. You can help to supply them by buying War Savings Bonds and Stamps.

Let us show you how others are SAVING TIME... REDUCING REJECTS... LOWERING COSTS

CLEANING SHELL CASES

The "Case History" shown here is one of a series illustrating how DuBoy Products eliminate corrosion, tarnish, and other shell cleaning problems in prominent War Plants.
This is only one of the many Metal Cleaning Problems solved by DuBoy Engineers. Send for other "Case Histories" that show how DuBoy Metal Cleaners have helped to improve operations *similar to* yours.



THE DUBOIS COMPANY · CINCINNATI, OHIO

TRAINED SERVICE TECHNICIANS AND WAREHOUSE STOCKS IN CITIES FROM COAST TO COAST

Metal Finishers Turn to Corronizing Process

By JOHN E. HUBEL

NOW it is corronizing that is taking the spotlight among coating processes. Originally developed for coating automobile bumpers by the Standard Steel Springs Company of Coraopolis, Pennsylvania, that company has now licensed a number of the largest metal processors in this country, including American Chain Company, Hanover Wire Cloth Company, Carnegie Steel Company, Outboard Marine & Manufacturing Company, Pittsburgh Steel Company, Republic Steel Company, Wheeling Steel Company, Youngstown Sheet & Tube Company, Robertshaw Thermostat Company, and others. The licensor reports that one of the first applications of the process was the coating of tanks to hold insecticide for spraying outfits marketed by Sears, Roebuck & Company. Since then the largest processors of metal have taken to this new process, for coating sheet, strip and wire products.

Corronizing, as is rather well known now, consists of coatings which are formed by electroplating a thin layer of nickel on the base metal, followed by a layer of either zinc or tin much

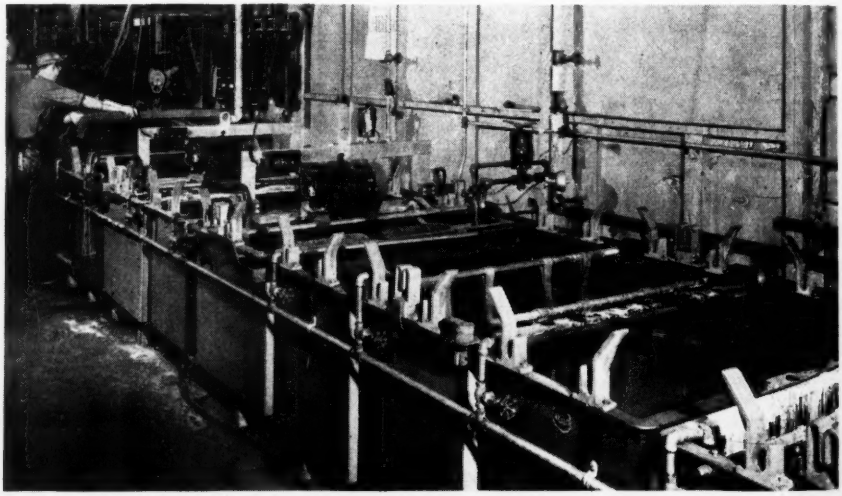
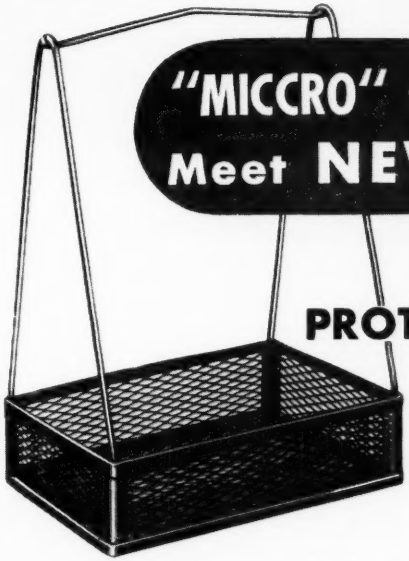


Fig. 1—A view of a typical corronizing setup showing layout of equipment at the Evinrude Motors, Division of Outboard Marine and Manufacturing Company.



"MICCRO" COATING MATERIALS Meet NEW Requirements

for Effective

PROTECTION of BASKETS Used In Washing and Pickling Processes

Until recently, baskets used in carrying parts through processes of alkali washing, petroleum spirits or emulsion cleaning, and pickling have been manufactured of special alloy steels which were impervious to the solutions used. Today, those alloys are not available, and baskets must be made of ordinary metals which show quick deterioration unless protected by a coating material.

The use of Miccro Supreme Stop-Off Lacquers and Miccrolite provides the most effective and economical method of protecting metal baskets. In addition to offering unequalled resistance to the various solutions, these coating materials also resist the abrasive effects of loading the basket with metal parts or the wear to which they may be subjected on certain types of conveyors.

Miccro coating materials can be quickly and easily applied in your own plant. Or, if you prefer, we now have facilities available to handle the work for you . . . efficiently and at moderate cost. WRITE FOR FULL DETAILS.

Developed and Manufactured By Experienced Platers

MICHIGAN CHROME & CHEMICAL CO.
6342 EAST JEFFERSON • DETROIT, MICHIGAN

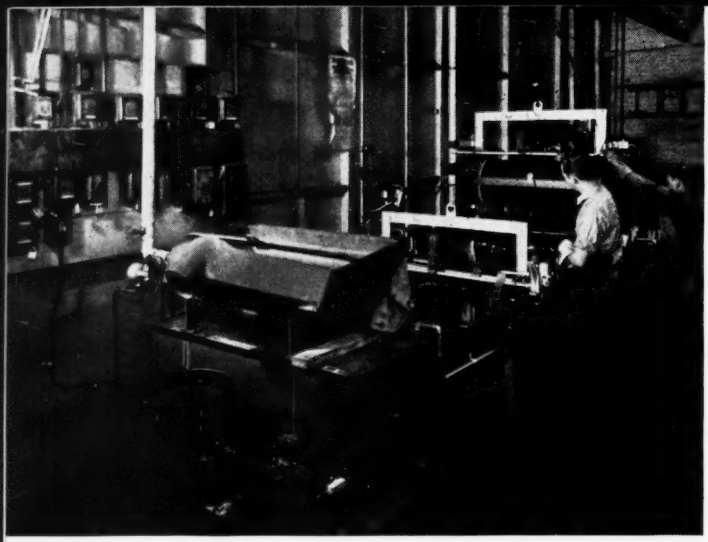


Fig. 2—Another view of the corronizing set-up shown in Fig. 1. This shows the unloading end and the electrical control equipment.

thinner than ordinarily used for equivalent galvanized or tin coatings. Conventional electroplating equipment and standard plating solutions can be utilized with only minor changes, the novel features of the process arising from the technique of application and subsequent treatment. After the two metallic layers have been plated on, the coating is baked at a fairly high temperature—from 500 to 750 deg. F. —for approximately one hour, during which time the two metals mutually diffuse to form layers of alloys of different composition. The resultant coating not only is highly resistant to corrosion in salt sprays, humidity and normal atmosphere tests, but it is also reported that it can be twisted, bent, molded, soldered and even welded satisfactorily.

The coating has excellent corrosion resistance and permits fabrication of soldering and welding. It is especially effective on fly screen material, with which processors have usually had trouble in coating, and it will no longer be necessary to paint screens, which is one of the bothers of users of screens. One large screen material supplier is now guaranteeing corronized screens for fifteen years. Corronizing has also been adopted by makers of wire fencing, makers of surgical instruments, metal stampings and many other parts that have always been difficult to keep from rusting or corroding.

It is reported that typical corronized coatings of .0001 in. thickness, containing one part of nickel or two of zinc, have salt spray corrosion resistance equal to that of hot-dipped or electroplated zinc coatings more than twice as thick. It is said that the advantage of this process decreases with greater thickness, reputedly becoming inappreciable at 0.01 in. of layering.

Up to recent date, atmospheric exposure tests have not been completed, but preliminary indications reported are that the superiority predicted by accelerated tests will be fulfilled in actual use of this process. The coating is said to have the tendency to self heal when failure occurs, thus slowing up complete deteriorization.

Another feature of corronizing is the reduced quantities of metals necessary for a given quality of protection, and corronizing is now said to compare favorably with hot-dipped and electroplated zinc coat in the field, although its possibilities have not been definitely established for high-quality applications of various kinds.

At present, the corronizing process

TO EXECUTIVES:

NOW YOU CAN HELP

Even more...

New Treasury Ruling Permits Purchases UP TO $100,000 In Any Calendar Year of Series F and G WAR BONDS!

This is not a new Bond issue and not a new series of War Bonds. Thousands of individuals, corporations, labor unions, and other organizations have this year already purchased $50,000 of Series F and G Bonds, the old limit. Under the new regulations, however, these Bond holders will be permitted to make additional purchases of $50,000 in the remaining months of the year. The new limitation on holdings of $100,000 in any one calendar year in either Series F or G, or in both series combined, is on the cost price; not on the maturity value.

Series F and G Bonds are intended primarily for larger investors and may be registered in the names of fiduciaries, corporations, labor unions, and other groups, as well as individuals.

The Series F Bond is a 12-year appreciation Bond, issued on a discount basis at 74 percent of maturity value. If held to maturity, 12 years from the date of issue, the Bond draws interest equivalent to 2.53 percent a year, computed on the purchase price, compounded semiannually. The Series G Bond is a 12-year current income Bond issued at par, and draws interest of 2.5 percent a year, paid semiannually by Treasury check.

SAVE WITH

War Savings Bonds

This space is a contribution to America's All-Out War Program by PRODUCTS FINISHING

is only available in smooth, compact and dull coatings, but it is reported that coatings are being developed which are semi-bright and are said to resemble conventional hot-galvanized wiped coating in appearance and with an improved and long lasting, quality finish.

Those who know, say that great things are ahead for corronizing, as more and more metal manufacturers and processors are taking on this process under license. While it is true that progress in this line may be curtailed somewhat during the war, due to the nickel and zinc used in the process, when the war is won this industry is expected to be one of the most flourishing.

Oakite Manual Describes Aviation Cleaning Problems. A comprehensive yet concise data manual of 40 pages covering all essential phases of cleaning required in aircraft production and maintenance was recently issued by Oakite Products, Inc., 20 Thames St., New York City. Written specially for executives responsible for the various types of work where degreasing is an integral operation in the manufacturing cycle or in the maintenance program as well as for those workmen charged with the actual performance of the cleaning, this manual gives factual information on several new, specialized materials for handling over 35 different cleaning operations by tank immersion, steam-detergent and air-pressure-spray methods.

Among the production operations discussed are safely cleaning aluminum alloy parts before resistance spot welding; preparing aluminum, magnesium and their alloys for anodizing or other protective surface treatment; degreasing ferrous and non-ferrous metals before such fabricating operations as heat treating, Magna-flux testing, pickling, inspection and assembly; rust-proofing parts in process; and preparing work for electroplating, painting, or other finishes. The data presented on airplane maintenance includes cleaning planes after test flights; washing plane interiors; cleaning engines, wheels and under gear, cockpits, and so on.

In addition, the manual also reviews a wide range of production equipment maintenance and plant housekeeping work common to aircraft and accessory manufacturing plants. Subjects discussed in this connection include cleaning paint spray booths, machine shop equipment, cutting and grinding oil lines; removing lime-scale deposits from refrigerating condensers, dynamometers and other water-circulating equipment; cleaning floors; walls, and so forth; and laundering towels, uniforms, overalls, waste and wiping cloths.

Copies of this fact-filled manual are available upon request.

Manual of Products. There is a crying need for Speed in war production. Not only speed of production, but speed in locating companies who can manufacture necessary items. To facilitate this, Interchemical Corp., 75 Varick St., New York City, has organized the technical and sales staffs of all of its divisions and subsidiaries in a coordinated effort to make its varied and comprehensive plant equipment available for war work.

Each division was requested to analyze and report on its production facilities and to list the war products it was making. These facts from each subsidiary were compiled, edited and published in a "Manual of Products."

A series of sales organizations meetings was held in the major territories, at which, for the first time, salesmen from all the Interchemical's divisions and subsidiaries sat down to plan together for an all-out war business program.

The products of Interchemical, its divisions and subsidiary companies constitute a great volume of production in the protective and decorative chemical coating industry. One of these companies alone produces 85 different protective coatings which are now used on war machines and equipment.

Heretofore each company in the corporate set-up has confined itself to its own particular field of operations. As a result of the "Manual of Products" and of the sales meetings, every salesman is equipped to tell what each division of Interchemical is doing and what each division can make.

The "Manual of Products" was distributed to employees of Interchemical and is available outside the company only to governmental bureaus and other authorized purchasing personnel.

Foxboro Bulletin A-264. Instruments for the automatic measurement and recording of densities of process liquids are described and illustrated in Bulletin

A-264 now being issued by The Foxboro Company, Foxboro, Massachusetts.

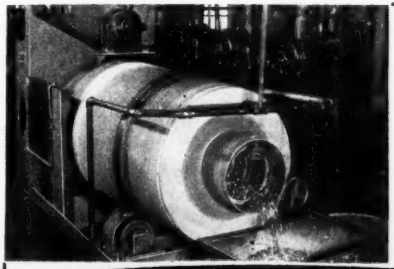
Instead of periodic readings by hydrometer and still samples, the Foxboro Density Recorder records the continuous, direct measurement of the flowing liquid. For processes where automatic control of density is important for operating efficiency, The Foxboro Stabilog Density Controller is supplied. The instruments have identical measuring systems and both use standard Foxboro charts, which may be read in specific gravity, Baume, Brix, or other recognized scales. Charts may be read to small unit values, and the accuracy of the measuring and recording is said to be unaffected by turbulence, viscosity, or by foam. Installation of either instrument is relatively simple. Auxiliary equipment for the installation is also shown in the bulletin.

Copy will be sent free upon request.

Supplements for "Priorities in Force." The Divisions of Industry Operations, War Production Board, Room 1501, Social Security Bldg., Washington, D. C., is now issuing the second in a series of supplements to be used with the revised edition of printed compilation of priorities orders and forms called "Priorities in Force." The revised booklet, which merges the original booklet, dated to March 31st, and its corresponding supplements in one alphabetical listing of all priorities actions through May 31, 1942, will be available for distribution soon.

The present supplement adds to the revised publication the orders issued for the period June 18 through June 24. The first supplement to this revised booklet, issued June 13, listed priorities actions for the period June 1 through June 10 and may be obtained by requesting WPB-1332.

Chisholm - Moore "Meteor" Electric Hoist. The Chisholm-Moore Hoist Corp., Tonawanda, N. Y., announces a 28-page catalog covering the CM "Meteor" Heavy Duty Electric Hoist. The catalog completely describes all the features of the hoist, and illustrations are used throughout to picture practically every advantage. The catalog includes a large colorful illustration of the Meteor, detail drawings of the hoist, all types of suspension and trolley arrangements, and a list of accessories that are available. Copy free upon request.



LET'S BREAK THE TAPE SOONER IN THE RACE FOR PRODUCTION

RANSOHOFF

Metal Cleaning EQUIPMENT

helps you in the race against time and production lags. Small parts are cleaned quickly, perfectly and economically. Your schedules go through without a hitch. You're able to depend on meeting or beating your program.

IDEAL

Illustrated: Automatic ball return burnishing barrel.

Ransohoff Engineers are glad to help you in your problems . . . just write, wire or phone Dept. PF.

N. RANSOHOFF, Inc.

Cleaning Machine Specialists

Township and Big 4 R.R., Cincinnati, O.

Modern Gold Plating — Part 25

By JOSEPH B. KUSHNER, CH. E.
Metal Finishing Consultant
New York City

IN the previous chapter we derived an equation for determining the concentration of a harmful ion in the plating bath that has been introduced into it by drag-in and evaporation replenishment with tap water. This equation was:

$$(5E)\quad C_x = \left(\frac{a+b}{a}\right) C_0 \left[1 - e^{-an_1x/V_0}\right] + C_i e^{-an_1x/V_0}$$

Where, x is the number of days of operation.

C_x is the concentration of the harmful ion after x days of operation.

b is the volume of water evaporated from the tank per rack plated.

a is the volume of drag-in or drag-out per rack plated.

C_0 is the concentration of the harmful ion in the tap water.

C_i is the initial concentration of the ion in the plating bath.

V_0 is the volume of the plating bath at correct operating level.

n_1 is the number of racks plated per day.

It is understood that these are average values and compatible units of measurement are used.

Equation 5E was derived on the basis of a 24-hour day of operation, which is the case in many war plants where plating and anodizing is carried out on a continuous 24-hour schedule. However, in a great number of plating rooms, the working day is only eight hours long. The plating tanks are kept hot and operated only during those hours. Nevertheless, evaporation of the plating bath continues apace during the idle sixteen hours that follow operation and the following morning, when replenishing our tank with water we have to add water to make up for this evaporation as well as that occurring during working hours. This fact can very readily be allowed for in equation 5E.

If we call the total volume of plating electrolyte evaporated outside of working hours during a 24-hour day, E_0, then it can easily be shown by methods used in deriving equation 5E that the concentration of the harmful ion after x days of operation is:

$$(14E)\quad C_x = \left(\frac{a+b+E_0/n_1}{a}\right) C_0 \left[1 - e^{-an_1x/V_0}\right] + C_i e^{-an_1x/V_0}$$

where all the symbols have the same meaning as before.

This equation is exactly like equation 5E except for the addition of the term $\frac{E_0}{n_1}$. It can be simplified somewhat by making use of the fact that the total evaporation from the plating bath during working hours is bn_1 and the total drag-in is an_1. If we call the evaporation during working hours E_ω then $E_\omega = bn_1$ and $b = \frac{E_\omega}{n_1}$. If we call the total volume of daily drag-in, D, then $D = an_1$ and $a = \frac{D}{n_1}$. If we substitute these values of a and b back into equation 14E, wherever they occur, we get:

$$(15E)\quad C_x = \left(\frac{D + E_\omega + E_0}{D}\right) C_0 \left[1 - e^{-Dx/V_0}\right] + C_i e^{-Dx/V_0}$$

Now E_ω plus E_0 is the total evaporation of liquid over a 24-hour period. If we call the sum of these two, E_t then,

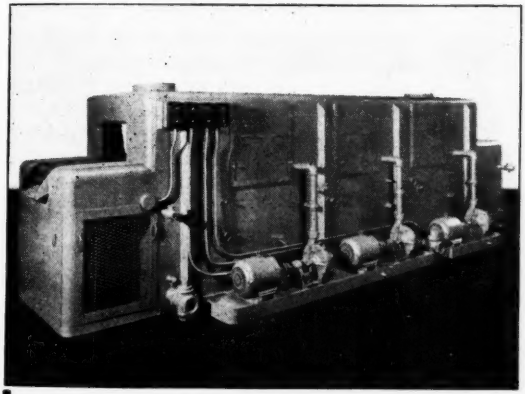
$$(16E)\quad C_x = \left(\frac{D + E_t}{D}\right) C_0 \left[1 - e^{-Dx/V_0}\right] + C_i e^{-Dx/V_0}$$

This equation can be rewritten by factoring, if desired, as

$$(17E)\quad C_x = \left(\frac{D + E_t}{D}\right) C_0 + \left[C_i - \left(\frac{D + E_t}{D}\right) C_0\right] e^{-Dx/V_0}$$

As was shown in connection with equation 5E, the limiting value of C_x

LINE SPACE SAVER . . .



Be it production or assembly line, if you are pressed for space by repeated plant expansions, Howard equipment may offer an ideal solution for your line cleaning and finishing problems. On the Conveyor Wash and Rinse machine shown, drive motor and gear reducer are mounted under the left end of the machine; cleanouts and chip screens are easily accessible inside the machine.

Howard sales engineers will be glad to discuss your problems, offering an intelligently engineered, reasonably priced machine. No obligations, of course.

ILLUSTRATED CATALOG ON REQUEST.

Write to:

HOWARD ENGINEERING & MFG. CO.

1056 HULBERT CINCINNATI, OHIO

as x gets larger and larger is

$$C_x = \frac{(D + E_t)}{D} C_0$$

For small values of x, equation 17E simplifies to

$$(18E)\quad C_x = \left(\frac{D + E_t}{V_0}\right) x\, C_0 + C_i \left[1 - \frac{Dx}{V_0}\right]$$

In the special case where the plating bath is made up with tap water and the harmful ion is not present in the plating salts, 18E reduces to:

$$(19E)\quad C_x = C_0\left[1 + \frac{E_t x}{V_0}\right]$$

In the special case where the plating bath is made up with distilled water, 18E reduces to:

$$(20E)\quad C_x = \left(\frac{D + E_t}{V_0}\right) C_0\, x$$

On many occasions it will be of interest to know in how many days a certain concentration of the ion will be reached. To do this we solve equation 17E for x and get as a result:

$$(21E)\quad x = \frac{V_0}{D} \frac{1n(C_0\,(D + E_t) - C_i D)}{C_0\,(D + E_t) - C_x D}$$

where 1n stands for natural logarithm. Few platers have access to tables of natural logarithms, but a regular log table or a slide rule can be found almost anywhere. This being the case, it is easier to use the above equation by converting to regular logs, and the converted equation assumes the form

$$(22E)\quad x = \frac{2.3\, V_0}{D} \log \frac{(C_0(D + E_t) - C_i D)}{C_0(D + E_t) - C_x D}$$

We can also solve the simplified equation 18E, for x and get:

$$(23E)\quad x = \frac{V_0\,(C_x - C_i)}{D\,(C_0 - C_i) + E_t C_0}$$

But this equation can give rise to large errors if x is not small, so we advise against its use indiscriminately. It is better to use equation 22E and get an accurate result.

Applications to Anodizing

In the anodizing of aluminum plane parts by the chromic acid process, certain Naval specifications call for the use of an anodizing bath whose maximum permissible chloride concentration is .2 grams per liter (chlorides are highly detrimental in anodizing. This concentration of chlorine is equivalent to 200 ppm. Almost all raw waters and treated waters contain chlorine ions. The concentration of chlorine in these waters may run from 1 to 100 ppm. As a result of this, many manufacturers start off their anodizing baths with distilled water, to extend the life of the baths.

In this connection, several interesting questions arise that can be answered by our equations. The first one that comes to mind is, knowing the chlorine ion concentration in the available tap water, in how many days will the chlorine ion concentration reach the maximum permissible under the Navy specifications, if the bath is made up with tap water? A second question, is, how much longer will the bath life be extended by the use of distilled water in making it up? We will consider some examples.

An aircraft manufacturers has an anodizing tank containing 1,000 gallons of solution at the regular solution height of 50 inches. The water analysis of his local water supply shows 40 ppm. of chlorine ions. From the last math made up he knows that the total evaporation over a period of 24 hours causes a drop in the solu-

tion level from 50 inches to 40 inches. Also, from previous tests he knows that the average daily drag-out for the class of work he does, amounts to 10 gallons. If he makes up a fresh anodizing solution with tap water, how many days will it take before the chloride concentration reaches the maximum permissible under his Navy contract?

From the figures, the total daily evaporation E_t, is $1{,}000\ (1 - \frac{40}{50} =$ 200 gallons. Using the limit formula, let us first see how high the chlorine concentration can build up, if we operate the bath indefinitely. The limiting value is $\frac{(D + E_t)}{D} C_0$ or $\frac{(10 + 200)}{10} 40 = 840$ ppm. It is important that this be done before anything else in working with the drag-in equation because if this limiting value is less than the dangerous concentration, the equation is not valid for solving for x inasmuch as the dangerous concentration will never be reached operating under the given conditions, no matter how long we continue working the bath.

This is more readily explained by an example. If, for instance, the above manufacturer's tank evaporation over 24 hours was 80 gallons and the drag-out was 25 gallons, the maximum concentration of chlorine ions that could be reached in the anodizing tank would be $\frac{(25 + 80)}{25} 40 =$ 168 ppm. Since this is less than the permissible 200, he could continue his operations indefinitely without ever reaching the danger point, provided, of course, that the same evaporation and drag-out rates were maintained.

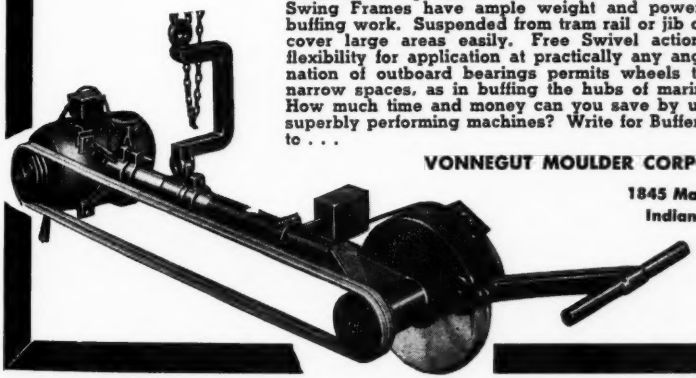
THE A. C. SIMPLIFIED MARSCHKE

SWING FRAME BUFFERS

The new Marschke Simplified Swing Frames are doing scores of buffing and finishing jobs faster, better and more economically than is possible with fractional horsepower hand tools or pedestal buffers. These modern Marschke Swing Frames have ample weight and power for most buffing work. Suspended from tram rail or jib crane, they cover large areas easily. Free Swivel action provides flexibility for application at practically any angle. Elimination of outboard bearings permits wheels to get into narrow spaces, as in buffing the hubs of marine screws. How much time and money can you save by using these superbly performing machines? Write for Buffer Bulletins, to . . .

VONNEGUT MOULDER CORPORATION

1845 Madison Ave., Indianapolis, Ind.



In actual practice the volume of drag-out is usually considerably smaller than the evaporation volume, however, so cases of this kind would be rare.

Getting back to the original problem, we have as the value for the life of the bath (as regards chloride concentration) from equation 22E,

$$x = \frac{2.3 \times 1{,}000}{10} \log \frac{40 \times 210 - 40 \times 10}{40 \times 210 - 200 \times 10}$$

$$= 230 \log 1.25 \qquad \log \text{ of } 1.25 = .097$$

$$= 22.3 \text{ days}$$

If we had used the simplified formula 23E, we would have gotten as our value for x,

$$x = \frac{1{,}000\,(200 - 40)}{100 \times 40} = \frac{160}{8} = 20$$

days, with an error of 10.3 per cent.

What advantage in bath life would the manufacturer gain by starting the bath with distilled water using tap water to replenish evaporation losses? In this case $C_i = 0$ so,

$$x = 230 \log \frac{8400}{6400}$$

$$= 230 \log 1.31 \qquad \log 1.31 = .117$$

$$= 26.9 \text{ days.}$$

The life of the bath is, therefore, prolonged 26.9 — 22.3 = 4.6 days. The percentage increase in bath life is 20.6 per cent.

Remembering that distilled water, if not manufactured on the premises, may cost anywhere from 10 cents to 50 cents a gallon, the relatively small increase in bath life may not warrant the initial expenditure on distilled water for making up the bath, if all evaporation replenishments are going to be made with tap water. This unfortunately is the usual case. A bath will be made up with distilled water and then all replenishments will be made with tap water.

It is of interest to study further this question of prolonging bath life by making up with distilled water and replenishing with tap water by means of the curves shown in Figure 1.

Taking the aircraft manufacturer as our guinea pig, we have possible, three curves, Nos. 1, 2, and 3. Curve No. 1 shows how the concentration would vary with days of operation under the given conditions if distilled water were used to make up the anodizing bath and distilled water were used to make up all evaporation losses. As can be seen, the highest chlorine ion concentration that would be reached is 40 ppm. This is far below the permissible maximum of 200 ppm.

Curve No. 2 shows how the chlorine ion concentration in the bath would vary if the bath were made up with distilled water and evaporation losses replenished with tap water and curve No. 3 shows the effects of making up the bath and replenishing with tap water. As can be seen, these two curves approach the same limit $\frac{(4 + E_t)}{D} C_0$ or 840 ppm. Curve No. 3 approaches the limiting value a little faster but there is not much difference between them.

As seen from the curves Nos. 2, 3, the increased bath life is always $x_i - x_0$. An expression for this increase in bath life can be readily obtained, by substituting back in equation 17E (the drag-in equation) the value for x_i with C_i equal to zero, and the value for x_0 when $C_i = C_0$. If this is done and both equations are set equal to each other, we get as a final result:

$$(24E) \quad x_i - x_0 = \frac{V_0}{D} \frac{\ln (1 + D)}{E_t}$$

If D is considerably smaller than E_t which is the usual case, $\left[1 + \frac{D}{E_t}\right]$ can

be approximated by $\frac{D}{E_t}$ so

$$(25E) \quad x_1 - x_0 = \frac{V_0}{E}$$

If we take the figures of the aircraft manufacturer, the increase in bath life by using distilled water make-up with tap water evaporation replenishment is $\frac{1,000}{200} = 5$ days. We got the value 4.6 days the long way as shown in Part 24 but this was a slide rule result. The exact increase as determined with 24E and a log book is 4.88 days.

The above formula, 25E, shows how the increase varies. It varies directly with the tank volume and inversely with the evaporation rate. From this we get two cardinal principles: (1) **Have the plating or anodizing tank volume as large as possible, (2) Keep evaporation at a minimum,** if you want the longest life (as regards chlorine build-up) from the bath when you make it up with distilled water and replenish with tap water.

The size of an anodizing tank is fixed by the space and cost factors as far as a given class of work is concerned. Evaporation rate is controlled by the temperature of the solution and its surface area. If a lower temperature can be used with equivalent results, the lower temperature should be used. In connection with the surface area some latitude is possible. Thus perhaps by hanging work in a certain position it will be possible to use a tank that is narrow and deep in preference to one that is wide and shallow. Any reduction in surface area gotten this way will materially reduce the evaporation rate.

There is another interesting possi-

How Metso Cleaners prevent waste

CUT DOWN REJECTS

Oil and grease on metal parts yield easily to Metso cleaning solutions. It's the high wetting power of Metso baths that quickly loosens oil and grease; and good emulsifying action holds them in the solution. Because of the valuable silica contained in Metso, the dirt is prevented from again sticking to the clean work.

Increase your production of chemically clean metal by reducing rejects. Let Metso help you to save time and materials. Our experience is at your disposal.

METSO CLEANERS
SODIUM METASILICATE
SODIUM SESQUISILICATE

PHILADELPHIA QUARTZ CO.
General Offices: Ionic & Third Sts., Phila., Pa.
Chicago Sales Office: 205 West Wacker Drive
9 Plants Distributors in over 65 Cities

ECONOMICAL BASIC SOLUBLE SILICATES

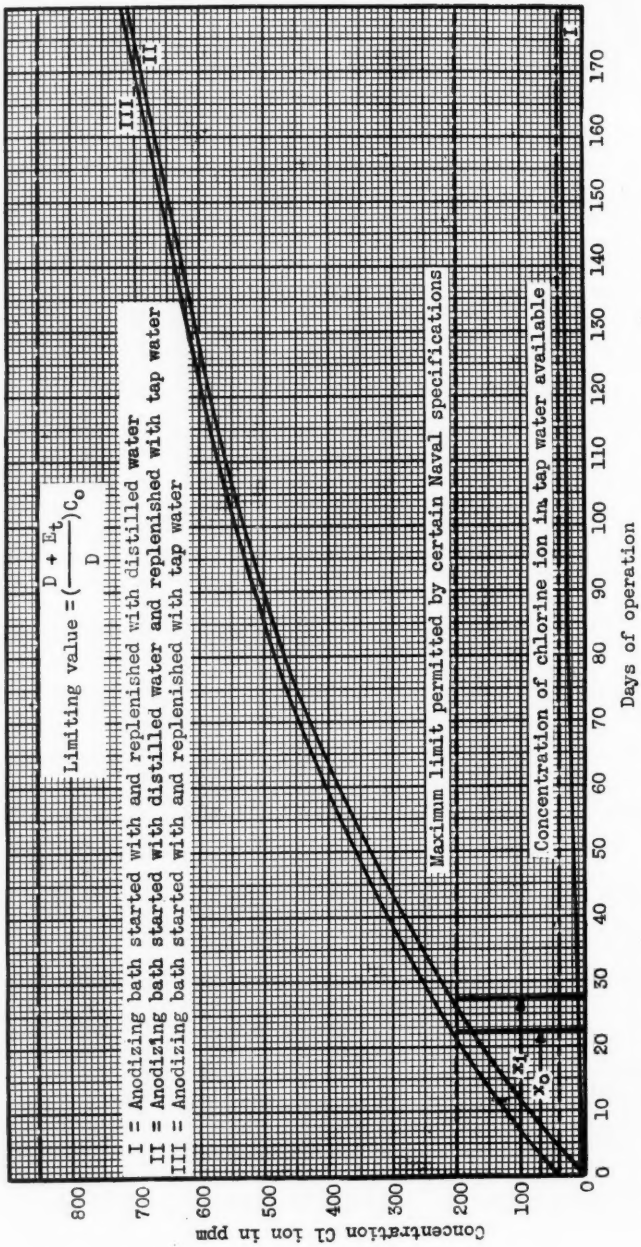

Concentration Cl ion in ppm
800
700
600
500
400
300
200
100
0
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170
Days of operation
I = Anodizing bath started with and replenished with distilled water
II = Anodizing bath started with distilled water and replenished with tap water
III = Anodizing bath started with and replenished with tap water
Limiting value = $(\frac{D + Et}{D})C_o$
Maximum limit permitted by certain Naval specifications
Concentration of chlorine ion in tap water available
x_1
x_o
I
II
III

Fig. 1—Graph showing variation in chloride concentration with time under different conditions in anodizing

bility. Suppose, for example, our manufacturer's water supply was very bad and ran 500 ppm. in chlorine ions. He would then obviously have to make up his anodizing bath with distilled water and replenish all evaporation losses with distilled water. Yet, under his conditions of operation with a drag-in of 10-gallons daily of rinsing tap water, the bath life would only be 51 days (using formula 2E of last month's paper) when the maximum permissible concentration of 200 ppm. of chlorine would be reached.

If the work could be rinsed off in distilled water before entering the anodizing tank, the chlorine concentration would never build up at all. The use of a running distilled after rinse prior to entering the anodizing bath

would, where large pieces are concerned, be economically unfeasible, but there is no reason why rinse could not be used on smaller items to insure the fact that no chlorine gets into the bath.

In the case of large items, a standing distilled water rinse tank, which for lack of a better name we can call a decontamination rinse, can be used prior to entering the anodizing bath. If this decontamination rinse were renewed with fresh distilled water daily, a material increase in the life of the bath as regard chlorine build-up could be established. It is something to think about where chlorine or some other water contaminant looms as a factor in anodizing.

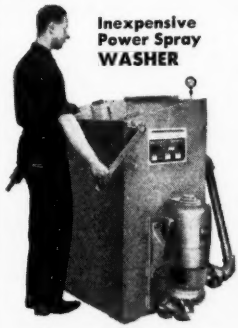
We have wandered pretty far afield in considering anodizing as an example for the use of the drag-in equation. Next chapter will be concerned with its application to gold plating.

"The American Line." A revised edition of "The American Line," a 12-page reference catalog on the entire line of products manufactured by the American Foundry Equipment Co., 555 S. Byrkit St., Mishawaka, Ind., has been released by this firm. This profusely illustrated catalog presents a complete summary of each of the following American products: Wheelabrator airless blast cleaning equipment — Tumblasts, Tablasts, special cabinets, and the new portable Wheelabrator; Dustube cloth bag type dust collectors; high efficiency Cyclone dust collectors; wet disposal unit for any tube dust collectors; sandcutters; sandblast equipment; rod straighteners, and the American-Heanium Long-Lyfe blast nozzle. Also included are illustrations of typical installations of these products in leading industrial plants, and a section containing a brief description of the mechanics and applications of the airless Wheelabrator method of abrasive blast cleaning. Copy of Catalog No. 40 free upon request.

Be a Ten-Pencenter. Now is the time to contribute ten per cent of your income for War Savings Bonds and Stamps.

Cleaning Costs *down* - Production *Up*

Inexpensive Power Spray WASHER



For racked parts or similar objects. Easy to operate.

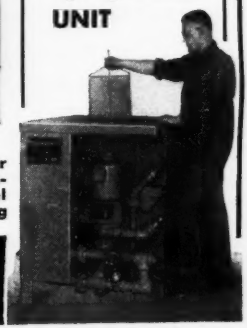
Rotary Table Washer

DIAMETER of TABLE 4 FEET

with METALWASH MACHINES

Interviews invited on engineering problems in this field.

Powerful Motorized Spray Rinse UNIT



Metalwash Co. also manufacture ---

Artillery Cartridge Case Spray Pickling and Processing Machines for brass or steel cases • Mouth and Taper Anneal and Treatment Processing Machines for brass or steel cases • Bonderizing Machines for steel artillery cases • Projectile Washing Machines • Projectile Quenching Machines

METALWASH MACHINERY CO.

149-155 Shaw Avenue Irvington, N. J.

Finishing Facts

War Production Spray-Gun Shy?

"LEMONS" recently rolled off a war plant production line because of "orange peel" finish—a paint man's term for a pebbly, unsatisfactory spray painting job. Management, nearly frantic at the slow-down, tried hard to search out the cause of the trouble and to determine how to stop the flow of rejects by getting the paint coating back to the proper smoothness and uniform thickness required by military specifications.

In these days of industry converted to manufacture of unfamiliar war goods, many similar bottlenecks are developing, directly traceable to unforeseen paint problems. If "orange peeling" doesn't make "lemons" out of products, blistering, running, cracking or sagging may.

The case of the "lemons" with the "orange peel" coating was solved as a result of a Du Pont service engineer's "shirt-sleeve" survey of plant conditions, equipment and materials being used. A prescription was written for a complete finishing system specifying in detail the spray gun, cap, needle, nozzle, and air and fluid pressures to be used as well as the finishing materials and thinning needed for pressures and top coats. Waste of valuable production time and materials ceased.

Manufacturers with finishing troubles are turning nowadays to paint service engineers of reputable firms, especially to those backed by a tradition of research. Chemists, laboratory technicians, production experts, service engineers and field representatives are available to join forces in "trouble-shooting."

To speed finishing and to conserve materials, the Du Pont Company is conducting an educational campaign to improve the quality and increase the efficiency of spray painting. Since Du Pont to its own satisfaction demonstrated during peacetime that spraying technique generally is subject to improvement — refrigerator finishing costs, for example, were gradually reduced from $2.50 per six cubic foot unit to 75c largely through better painting practices—educational efforts are timely under present conditions with many semi-experienced gun operators at work.

In a new booklet entitled "Hints on Wartime Finishing Economies," eleven factors which must be under control to produce faster, more economical finishing are described. The factors essential to efficiency and conservation are: Temperature of Paint; Air and Fluid Pressures; Viscosity of Paint; Adjustment of Spray Gun; Handling of Spray Gun Triggering of the Gun; System in the Strokes; Uniformity of Coating; Thickness of Film; Causes of Rejects; Touch-Up Procedure.

Obviously, there is plenty to know about paint spraying before satisfactory war-time efficiency is reached. The waste of which a careless or untutored operator may be guilty is realizable in the fact that a modern spray gun, opened wide, is capable of using $10 worth of paint an hour.

Under "Temperature," for example, in text and with photographs the following advice is given: "The temperature of paint should be close to 78 deg. F. The wrong temperature for finishing materials often causes a decided increase in the cost of materials per unit finished. This kind of waste is doubly costly when the watchword of industry is conservation, and is absolutely unnecessary when temperatures are so easily regulated and maintained."

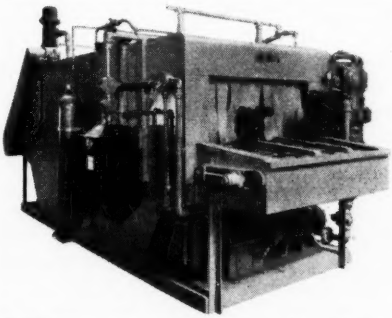
Speed - reducers are extra - stroke men whose guns are chronically out of adjustment requiring an unnecessary shot at the target moving by on the production line, the booklet points out. Other offenders against production pace are the "rhythm makers"—operators who work too fast, apparently feeling that once they get going the instrument must be kept swinging. Orderly, systematic procedure in slow, careful strokes is faster in the end, experts emphasize, meanwhile "arcing," "whipping," and non-specialization in touch-up work must be avoided to maintain speed.

Many a helpful hint is available here for production engineers and finishing foremen. Moreover, hundreds of specially schooled paint service engineers are on call for quick service in attacking war contract finishing problems. Manufacturers will often speed operations on vital goods by calling one in for information, service or help, whether there are kinks to be ironed out or the latest time-saving methods to be learned.

The man behind the spray gun speeds production—or retards it.

Brass Cleaned with Ferric Sulphate

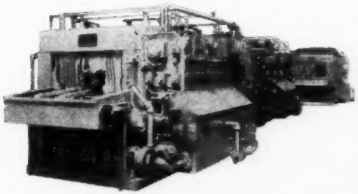
WITH the unprecedented boom in brass buttons — not to mention



150 Cylinders Cleaned per Hour

This special INDUSTRIAL Washing Machine was designed to wash airplane engine cylinders after teardown. Particular attention had to be given to the cylinder dome and shrink-band.

Cylinders are placed three abreast in copper-lined carriers. When cylinders reach proper position, washing nozzles rise into inside of barrels and thoroughly clean inside with a steady spray. Then sprays lower automatically to allow cylinders to pass into draining section and then into rinsing section where washing action is repeated. Average production is 150 cylinders per hour.



INDUSTRIAL Engineers can design and build *your* special equipment. *Write for complete details.*

INDUSTRIAL Washing Machine Corp.

291 BURNET ST. **NEW BRUNSWICK, N. J.**

brass hats — brass fabricators have discovered a new and easier way to produce the well-known shine for which these articles are noted.

Ferric sulfate, a rather drab member of the chemical world itself, has been found to do an exceptionally good job of removing ugly black smut and red cuprous oxide scale from the surface of the brass, according to Monsanto Chemical Company, Everett, Mass., which developed the process for commercial production of this chemical.

The stain and scale are formed by the annealing operation which removes internal strains set up by the stamping and forming of the cold metal. It is necessary that the stain and scale be completely removed in order to get a flawless, mirror-like surface when the brass is burnished.

The advantage of ferric sulfate over other chemicals previously used for this purpose is that it removes the stains more quickly and with less loss of metal, thus better preserving the design on the button as well as conserving metal.

Ferric sulfate is used for the same purpose in the manufacture of brass cartridge cases. Since the making of a cartridge case consists of a series of drawing and annealing operations, it is essential that all scale and stain be removed before each draw or there is likelihood of fouling or breakage of the drawing dies.

Copper Plating Eliminates Shaft Chatter

FIVE thousandths of an inch of copper plating recently averted a threatened shortage of electric power in the busy Boston war production area, according to the Electroplating Division of the E. I. du Pont de Nemours & Company, Wilmington, Delaware.

A vertical steam turbine in a local power plant developed a bad "chatter" and had to be shut down. The stoppage came as producers were increasing their demands for electric power.

Investigation showed the shaftway running through the center of the turbine's rotating field had so worn that the rotating field did not fit snugly enough on the 35-ton shaft.

Time, labor and materials would have been required to cast a new rotating field or to build a new shaft, which was approximately two feet in diameter and 30 feet high.

Then the suggestion was made that the "chatter" might be eliminated by building up the shaftway with an electro-deposition of copper, the largest plating undertaking ever attempted. A deposit varying from two to five thousandths of an inch did the job. The turbine was ready for service in about 24 hours.

Representatives of the Tremont Old Colony Plating Company, Boston, plated the shaftway with the assistance of Du Pont's Electroplating Division.

Industrial Rubber Conservation Sponsored by New U. S. Rubber Book. A 48-page illustrated book on conservation of rubber products in industry has been published by United States Rubber Company, Rockefeller Center, New York City. All rubber products now in use by industry are essential to war production and will become increasingly difficult if not impossible to replace.

Complete and explicit suggestions are given for the proper care of these important rubber products from initial design through inventory and storage to use, maintenance, inspection and repair.

The book, "First Aid to Industry in Conserving Rubber," is completely indexed and all mechanical rubber goods are included, such as, hose of all types; transmission, conveyor and elevator belts; mechanical packings; electrical tapes, wires and cables; molded and extruded rubber goods; rubber lined equipment; rubber mountings, mats and matting; printing materials; and rub-

ber bonded grinding wheels.

Copies of the book are being mailed immediately to more than 50,000 engineers, plant managers, superintendents, and others responsible for production and maintenance in American industries in all parts of the country, and other copies will be available on request.

General suggestions for the care of industrial rubber are summarized in a foreword for the book as follows: "Rubber has several natural enemies which are always ready to destroy it if given the chance. These include: oils, greases, solvents, concentrated acids, extreme heat, dryness, sunlight, and ozone. In combination their separately destructive actions are often accelerated tremendously.

"Other substances which may not be harmful to rubber itself lie in wait to attack cotton duck, metals, or other materials which are combined with rubber to form certain mechanical products. Some of these are: water, rot, alkalies, dilute acids and many gases. All rubber or rubber-containing products must be protected against these enemies and also against the special enemies of their particular kind."

A copy of this book will be sent free upon request.

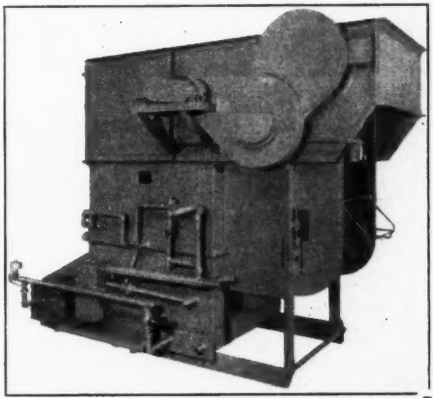
Automatic Spray Finishing Machines. To meet war production requirements, Spray Engineering Company, 114 Central St., Somerville, Mass., is manufacturing automatic and semi-automatic spray finishing machines for shells, incendiary bombs, flares, bayonet scabbards, and other essential war items. These machines are shown in a eight-page catalog now being issued by this company. The machines are designed to fit the specifications of individual customers as to production rates, space, location, number of operators, and so forth. The primary consideration in developing a particular machine is plant capacity. In many instances this means that a slower semi-automatic machine at much lower cost is to be recommended rather than a fully automatic type.

Copy free upon request.

"Filtaire" Portable Dust Collector. A four-page illustrated folder covering the features, applications, specifications, and so on, of the "Filtaire" Portable Dust Collector is now being issued by the Edward Blake Co., 634 Commonwealth Ave., Newton Centre, Mass. Copy free upon request.

YOU NEED
SPEED
IN YOUR METAL CLEANING
IN YOUR PRODUCTION
AND —
IN YOUR WAR WORK

We must all put in our best efforts to get the job done *now* and here is how you can speed up your production. For 100% efficiency in metal degreasers and metal parts washing machines, Blakeslee has always been and still is tops. Throughout the country, in all types of War Work, our equipment is doing its share toward increasing our country's war production. Wire, phone or write for our engineer or quotation.



The above machine is a compact, speedy automatic degreasing machine requiring the smallest amount of floor space. Used for degreasing fuse parts and mechanisms.

G. S. BLAKESLEE & CO.
NEW YORK CHICAGO TORONTO

News OF THE INDUSTRY

Research on Nickel at Mellon Institute

The International Nickel Company, Inc., 67 Wall St., New York City, has resumed investigational work at Mellon Institute of Industrial Research, Pittsburgh, Pa., by the establishment of an Industrial Fellowship that began operation on July 1st. This fellowship is concerned with a comprehensive program of scientific research on certain problems in the chemistry and technology of nickel, embracing particular attention to the preparation, properties, and uses of nickel compounds, especially organic derivatives.

Dr. John Gilbert Dean, a physico-organic chemist, is the incumbent of this fellowship. He received his professional education at Brown University and Columbia University and has subsequently had five years of experience in applied chemical research.

Paint Packed In Paper Cans

Paper paint cans are the latest contribution of The Sherwin-Williams Co., one of the largest manufacturers of paints and varnishes, to the war conservation drive. Top and bottom of the new container, which is the result of several months of experimentation at the company's Chicago Plant, are metal discs, but the body is made entirely of cardboard impregnated with an insoluble substance.

No tin at all is required. In fact, according to H. J. Hain, Vice-President who was in charge of the project to develop a "war emergency container," The Sherwin-Williams Co. restricted the use of tin plate several years ago when engineers at its Chicago Can Plant found that alloy coated plate made just as good paint cans as tin plate.

This alloy coated plate is now being used for the metal ends of the new container, but further experiments are already under way which, it is hoped, will result in the complete elimination of alloy plate and permit the metal discs to be made from lacquered black plate.

The biggest problem in developing the paper paint can was finding a method of moisture-proofing the cardboard. The common ice cream container could not be used because it would soak up the oils and solvents in paint, resulting in a soggy can and deteriorated contents. This obstacle was overcome by chemically treating the cardboard and placing an impregnated paper lining inside the can to prevent "wicking" or absorption.

According to Mr. Hain, the company

Illustration showing one of the new paper packages in which Sherwin-Williams products are soon to be available

does not claim that the new substitute is just as good as an all-metal container. A new label carries the line—"War Emergency Container — Handle with Care." However, the paper can has been tested extensively for wicking, for evaporation, and for shipping and storage qualities, and in each respect it has proved completely satisfactory.

Inside diameter of the new container, now in production in the quart size, is slightly less than the all-metal can because the walls are thicker. The height has been increased to allow for the change in diameter and for the generous "bite" with which the ends clamp the paper body. In addition to quarts, a half-pint and a gallon size will also be manufactured.

Another metal conservation measure recently introduced by Sherwin-Williams is the placing of a billing charge to the customer on large metal drums and a refund when returned to insure their quick return when empty. When returned, the drums are scoured with a caustic solution, spray-finished, and put back into use. This process can be repeated over and over again.

As a result of these and other conservation measures, The Sherwin-Williams Co. will now be able to get along with less than half as much metal plate as it used for containers in 1940. The remainder will be released for war production.

Porcelain Enamelers Study Heat Treating Possibilities

The Forum Committee of the Porcelain Enamel Institute recently held a second meeting on heat treating at the Statler Hotel, Cleveland, Ohio. Harry McQuid, Republic Steel Corp., discussed the conversion of porcelain enameling plants to heat treating. H. G. Mead, of Leeds and Northrup Corp., gave a talk on control instruments, and H. C. Carpenter, Lee Wilson Furnace Co., showed how porcelain enameling furnaces can be used in the war effort.

John Virden, Regional Director of the War Production Board, discussed the work of his organization and E. S. Dowd, Regional Salvage Manager, started the scrap collection program for this industry.

A panel discussion of heat treating included talks by Dean Bradley Stoughton, Lehigh University; W. G. Hildorf, Timken Roller Bearing Co., W. H. Wilson, Ferro Enamel Corporation; R. M. King, Ohio State University; F. E. Hodek, Jr., General Porcelain Enameling & Mfg. Co.; and Dr. A. I. Andrews, of the University of Illinois.

Twenty-four plants in the Porcelain Enamel Institute are partially employed on heat treating of war work. A number of other plants in the porcelain enameling industry are converted to war work or are in the process of conversion. The porcelain enameling industry is one of the few smaller industries which have found it possible to change over to war production, largely through its own efforts.

Films of Grand Rapids June, 1942 Convention

Films of the Grand Rapids A.E.S. National Convention are available for showing at Branch meetings throughout the country after September 15, 1942. They were taken by a professional and are offered to the members of the American Electroplaters' Society by The Lea Mfg. Co. as sponsors. The films are a silent version, 16 mm., and shoul be projected on Bell & Howell or Eastman 16 mm. silent equipment. The films are of about 15 minutes duration.

Notice is particularly called to Libra-

CUT DOWN REJECTS
WITH
ORVUS
IN YOUR METAL CLEANING BATHS
This sulfated fatty alcohol Cleansing Agent is EFFECTIVE
—as a surface tension lowering agent
—as an emulsifier
—in dispersing lime soaps which might cause poor plating results if permitted to deposit on the metal
Write for further information about Orvus to
PROCTER & GAMBLE, Cincinnati, Ohio

rians of A.E.S. Branches throughout the country. Here is a subject which is of extreme interest to members of the A.E.S. whether or not they attended the Convention at Grand Rapids. In the film, prominence is given to individual close-ups of men in the industry from all over the country. Many indoor and outdoor shots of excellent composition are shown and will undoubtedly be of interest to all.

Anyone interested in showing these films should write to The Lea Mfg. Co,. Waterbury, Conn., as far in advance as possible. There will be no charge of course for the films, the only request of the sponsors being that the people showing the films pay expressage both ways.

Electroplating Courses

The Institute of Electrochemistry and Metallurgy, 59-61 E. Fourth St., New York City, will offer specialized courses in the field of electroplating and metallurgy during 1942-43. Registration will be held for the Fall term from September 21 to 25 and the first class will be held on September 29. Registration will be held for the Spring courses from February 1 to 5, inclusive, and the first class meeting will occur on February 9. The following studies will be offered: Electroplating I, Metallurgy I, Research, I, and Industrial Microscopy IA.

McNerney Joins Wilbur & Williams

George J. McNerney has joined the Wilbur & Williams Company of Boston. Massachusetts, and will make his headquarters at Buffalo. Mr. McNerney, as Divisional Manager, for this leading manufacturer of chemical protective coatings, brings to his new connection a wealth of varied experience which is unique in the paint industry.

For sixteen years—1926-1942—Mr. McNerney was connected with the Craftex Company and its successor, the National Gypsum Company; and is generally recognized as having done more than any other one man, or group of men, to open the market and set the trend for casein paint as well as textured wall materials.

As an efficient, resourceful, aggressive paint merchandiser, Mr. McNerney has no superior. His co-operation with painting contractors, architects, purchasing agents, jobbers and their salesmen has been most helpful and productive to all concerned. In his new connection he will promote the various highly specialized paints developed during many years by the Wilbur & Williams Company to solve many difficult problems in industrial maintenance and product finishing.

His many friends throughout the middle west will doubtless be interested in learning of his new connection; and can rely upon him for merchandising counsel and practical painting advice, as they have for so many years in the past.

War Production Eye-Strain Relief Through Glareless Fluorescent Light

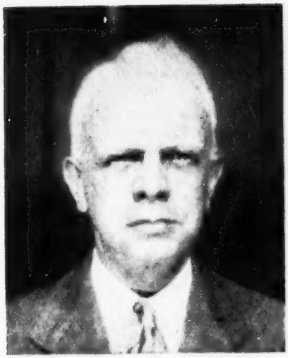
Glareless fluorescent lighting must play an increasingly vital part in war production as working hours are stretched out, states the Fluorescent Lighting Association. With straight time and overtime frequently totaling 50, 60, 70 and more hours weekly for some workers, the factor of eye-strain and attendant fatigue is taxing the talents of the illuminating engineer. The trend is definitely set towards fluorescent lighting in providing veritable 24-hour daylight, and more recently for the improved cold-cathode type which virtually stretches out the glowing tubing to yards instead of feet, in spreading the illumination over the entire working area while minimizing glare.

Smith Joins Detroit Rex Staff

Chester W. Smith has joined the staff of the Detroit Rex Products Company, 13005 Hillview Avenue, Detroit, Michigan, as Research Chemist in the Alkali Division.

Mr. Smith has been a specialist in the field of electrochemistry as applied to electroplating for the past eight years. He was formerly affiliated with the J. C. Miller Company as chief chemist working on research and development of materials for the field of electroplating.

He was 1942 National Convention Chairman for the American Electroplaters Society, as well as vice-president and librarian of the A.E.S. Grand Rapids branch. He is also a member of the American Chemical Society.



William J. R. Kennedy

JUST as we go to press we learn of the death of Wm. J. R. Kennedy, who for many years has graced and dignified the office of Secretary to the American Electroplaters' Society. The news was rather a shock to us though we knew that Bill had not been well for some time past. Your editor feels a personal loss in the passing of Bill Kennedy, for Bill was always ready with sound and helpful advice when it was needed and there was probably no single individual in the electroplating industry who possessed a better over-all knowledge of the industry than Bill did.

Bill Kennedy was one of the hardest working men we ever knew. His secretarial duties made it imperative that he attend meetings, and Bill always seemed to be present whenever anything of importance to the industry was going on. He was out on the road a good share of the time traveling and calling on the various chapters of the Society, talking to groups on timely subjects and offering the benefit of his experience where advice seemed to be needed. His heart and soul were in the American Electroplaters' Society and it seemed to us that the welfare of the Society was behind his every thought and move. His passing will be a definite loss both to his many friends in the industry and to the Society as a whole.

Bon voyage, Bill!

New PLANT EQUIPMENT AND Materials

Hanson-Van Winkle-Munning Wire and Tampico Brushes

The Hanson-Van Winkle-Munning Co., Matawan, N. J., manufacturer of electroplating equipment and supplies, has developed new types of wire brushes and Tampico brushes for cleaning, polishing, and finishing metals. Early in the manufacture of these brushes, steel flanges were used, but the steel has now been replaced by fibre, to conserve metal, reduce the shipping weight, and also to place less load on the spindles. The wire sections are made in sizes from 6 in. to 15 in. diameter, inclusive.

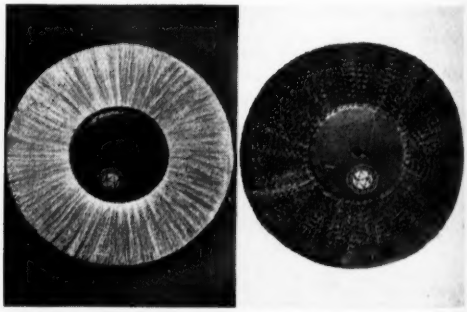
The fibre flanges on the Tampico sections make a better brush for the reason that they can be used for either wet or dry work. The sections are made in sizes from 6 in. to 18 in. diameter, inclusive; and the solid brushes, in sizes from 8 in. to 18 in. in diameter, inclusive. These products have been given the trade name "Staplbond."

Staplbond Steel Wire Sections are recommended for cleaning, polishing, and heavy brushing on steel, brass, and other metals, rubber, gear teeth and castings, and for removing rust, scale, corrosion, dirt, and paint.

Staplbond Steel Wire Sections feature sturdiness of construction. They are made of specially tempered, high carbon, crimpled steel wires, held in place by heavy twisted steel wire welded together, and then placed between high grade fibre flanges which are fastened together with hard tinned steel wire staples, stitched and clinched by an exclusive method, fastening the steel wire securely to the fibre center of the brush.

Each section is compactly filled and the wires stand out stiffly to give a uniformly sharp scratching surface that will wear down evenly without bending or breaking and give a continuous sweeping action. Each section is approximately ⅜ in. thick, a complete wheel brush in itself, and is mounted directly on a shaft without the use of a hub or adapters. Any size arbor hole can be punched out as wanted. Any width of face can be obtained by assembling the desired number of sections on the shaft.

Staplbond Tampico Sections are used by metal finishers for the polishing and buffing operations. The density of the fibre is suitable for use with compositions and emery paste for producing a variety of finishes.



(Left)—Staplbond Tampico Section
(Right)—Staplbond Steel Wire Section

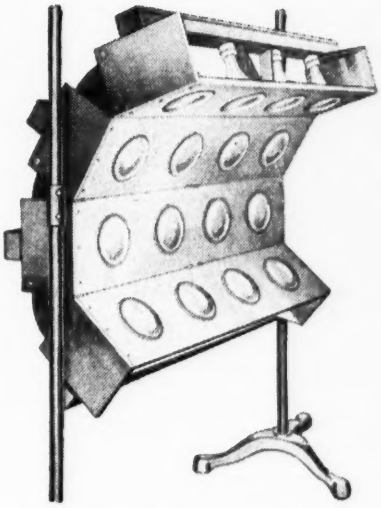
Staplbond Tampico Sections are made of heavily filled, select, medium grade white tampico fibre, which is evenly distributed in the brush by hand on special machines, and held in place by a triple ring of wire which locks the tampico fibre in a powerful grip. High-grade fibre flanges are fastened together with hard tinned steel wire staples by a special method to hold the tampico fibre securely in the brush. This construction is said to eliminate warping and splitting, and is satisfactory for wet or dry heavy duty work.

Each section has a dense face for efficient performance and is a complete wheel, designed to be mounted directly on a shaft without the use of adapters or hubs. Any desired arbor hole can be punched out as desired. Each section is approximately ½ in. thick and any number of sections can be assembled directly on the shaft to make the required width of face needed. A perfectly balanced wheel is obtained by multiple dies which punch the arbor hole and trim the outer periphery of the brush in one operation.

Solid face tampico brushes can be assembled as desired. These are preferred for convenience when the brush is used periodically, as they can be put on and taken off the spindle frequently. The brushes are assembled of Tampico Sections, securely fastened together to produce the required width of wheel from one-inch to six-inch face.

Wilson Infra-Red Drying Fixtures

The Wilson Mfg. Corp., 154 W. Erie St., Chicago, Ill., recently introduced a new Infra-Red drying tunnel. This new tunnel uses the General Electric combination reflector lamp for high operating efficiency and low maintenance costs. The over-all operating efficiency of this



Wilson Infra-Red Drying Fixture

new tunnel is said to be increased to the maximum through the use of lamp shields, plus complete flexibility of adjustment of each lamp row, making it possible to change the entire tunnel shape within three minutes.

The manufacturer points out that the maximum efficiency is obtained with these tunnels at all times through the use of this flexible construction. The tunnel can operate effectively on two or three completely dissimilar jobs in the same day, requiring practically no change-over time, which makes it ideal for job shop work as well as for production work. The universal flexibility of this equipment is said to assure free-

POLISH and BUFF *Automatically*

Today's Efficient Method of Volume Finishing

CATALOGS AVAILABLE

•AUTOMATIC POLISHING & BUFFING MACHINES

Packer-Matic

THE PACKER MACHINE CO., MERIDEN, CONN., U. S. A.

dom from change-over bottlenecks which might result when it is later converted to peacetime production.

The manufacturer claims this tunnel equipment can be used on 99 per cent of all Infra-Drying jobs. As a result, the company has tooled up for quantity production and carries a complete stock for immediate delivery. These tunnels are designed so that additional rows can be added to the tunnel sections, and tunnel sections can be joined end to end for increased tunnel lengths.

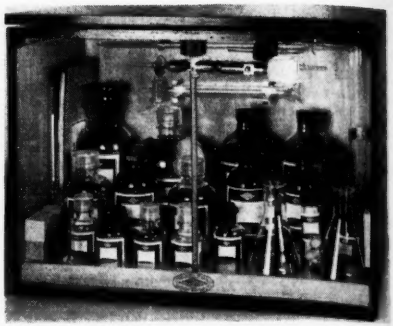
Monsanto D.P. Inhibitor Solution

D. P. Solution is the designation of a new corrosion-inhibiting liquid now being marketed by Monsanto Chemical Company, Everett, Mass., for addition to clear lacquers, nitrocellulose solutions, and shellacs, to permit transportation in metal containers that have not been lined with tin. The solution reacts with iron to farm an insoluble protective film of microscopic thickness that is self-renewing should it be broken by rough handling of the container.

The material is added to lacquer prior to packaging in the proportion of .1 to 1 per cent by weight. Following introduction into the lacquer it also acts as a flocculating agent to maintain suspension of flattening agents in flat lacquers.

LaMotte Control Unit

To meet the growing need for more complete tests in the plating room the LaMotte Research Department of the LaMotte Chemical Products Company, Towson, Baltimore, Md., has developed a new outfit which will enable the operator to make the following control tests: acidity and alkalinity (pH) of all types of baths, chlorides, nickel content, ferrous iron, acid copper, cyandie copper, acid zinc, cyanide zinc, cadmium, brass and bronze solutions.



La Motte Control Unit

This outfit is said to be inexpensive and easy to operate, yet the results are accurate in controlling the baths in electroplating and electroyping. All necessary equipment for making each test is included in a handy case which also includes complete instructions for making each test.

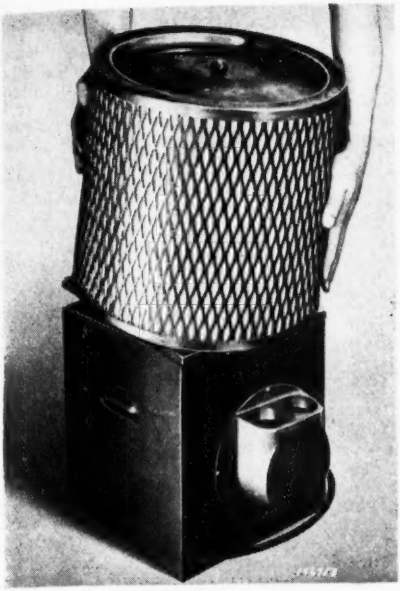
Cylindrical Type Filter for Aget-Detroit Model "600" "Dustkop" Self-Contained Dust Collector

A cylindrical type filter especially designed to increase the range of uses of its standard Model "600 Dustkop" Self-Contained Dust Collector so that it can be employed to collect dust from the largest types of tool, surface, and similar production grinding operations is announced by the Aget-Detroit Mfg. Co., 935 Book Bldg., Detroit, Mich. The filter is available as a complete unit so that when ordered as a replacement, the flat filter and louvered cover of the "Dust-

HARSHAW
ANODES AND
CHEMICALS

meet the highest standards of the plating industry . . . Anodes and chemicals for every kind of plating.

THE HARSHAW CHEMICAL CO.
Cleveland, Ohio and Principal Cities



Cylindrical Type Filter Being Applied to Aget-Detroit Model "600" "Dustkop" Self-Contained Dust Collector

kop" already in use can be discarded and the new filter fitted on without the use of tools, as shown in the accompanying illustration.

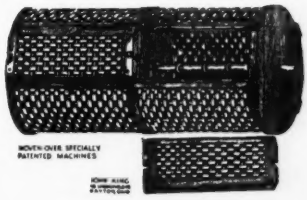
Having over five times the area of the standard flat filter, the new style filter while of sufficiently large area to reduce back pressure to a minimum is, however, small enough in diameter and height (15 x 12 inches) to obviate any increase in floor space required, thus enabling it to be used on a standard Model "600" even in under-bench installations.

Faster and easier removal of dust collecting pan, porportionately longer filter life as compared with that of the flat filter, and an increase of approximately 1,500 feet per minute air speed velocity without change in fan or motor are features claimed for the cylindrical type filter, the construction of which consists essentially of a single ¾-inch thickness of spun glass filter material held between an inner and outer shell of heavy gauge expanded metal. A single rod holds a cap and base plate tightly against the open ends of the shells to seal them. Dust laden air drawn in through the intake from the grinder enters the cylindrical filter through the base plate. When separated, the dust drops into the collecting pan, thereby permitting the cleaned air to pass through the filter and back into the room.

Filter material can be easily and inexpensively renewed. By removing a nut on the lower end of the single rod, the cap and base plate can be removed to permit the outer metal shell to be opened. After the old filter material is removed and fresh material wrapped around the inner shell, the outer shell is closed and the filter reassembled.

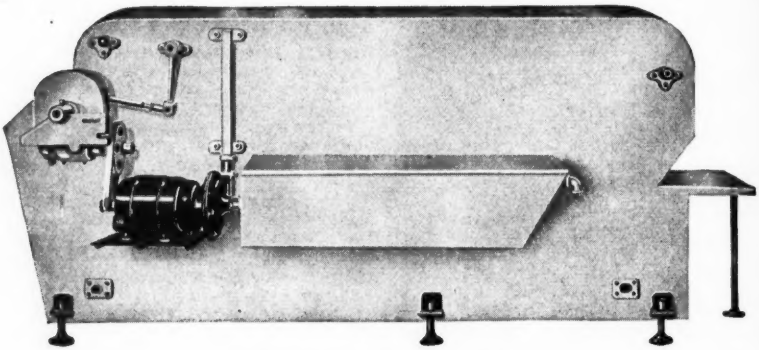
"Sturdy-Bilt" Metal Parts Washer

Known as the "Sturdy-Bilt" Metal Parts Washer, a machine for the soaking, washing, drying, and preparation of either rough or finish machined metal parts as well as complete metal assemblies is announced by the Sturdy-Bilt Equipment Corp., 1441 S. 65th St., Milwaukee, Wis. The machine is said to be specially designed for the cleaning

IN TIMES OF NEED
INVESTIGATE
KING

PLATING BARRELS
SIZES FOR ANY EQUIPMENT
Write for illustrated folder.
Use them once—you'll use them always
JOHN KING
48 SPRINGFIELD ST. DAYTON, OHIO

of shells, cartridges, munition parts, and so on.

The Sturdy-Bilt Washer offers a long dormant soak besides the customary method of a powerful hydro washing.



"Sturdy-Bilt" Metal Parts Washer

Parts are loaded and unloaded at a convenient platform, only one operator being required for performing both loading and unloading operations. After loading, parts are subjected to a long soaking in a very hot light alkali solution which lossens and removes all dirt and chips. This is followed by very hot and powerful clean water washes and rinses to remove any alkali or remaining dirt or chips. Sufficient time is allotted to permit the clean parts to thoroughly dry before reaching the unloading platform.

A simple "chip-remover" scrapes chips into a receptacle or "basket" at one end of the machine. This basket can be easily removed for emptying, thus enabling chips of scarce metal to be readily salvaged.

Turco Stripper L-595

A non-flammable, fast-acting, wax-free paint remover to be known as Turco Stripper L-595 was recently introduced by Turco Products, Inc., 6135 S. Central Ave., Los Angeles, Cal., to meet wartime industry's demand for greater safety.

According to the manufacturer, Turco Stripper L-595 can be used with complete safety near welding machines, electrical apparatus, grinding wheels and other equipment which generate heat and sparks. Danger of fire caused by sparks generated by cleaning metal surfaces with a wire brush or steel wool is eliminated. Inexperienced workmen, it is said, can use and work around Turco Stripper L-595 with complete safety. Other than proper ventilation, no special or elaborate precautions are necessary when using this new stripper.

Turco Stripper L-595 will not injure polished aluminum alloy, anodized alu-

RUST—TARNISH—OXIDATION removed quickly
WITH PEN-OX-SOL — fast penetrating solvent!

$1.70 for liquid concentrate to make a gallon! Save money. Merely add water. For Iron, Steel, Copper, Bronze, Aluminum, Chrome, Nickel Plate, Galvanized, etc. Delivered East of Mississippi at no extra cost. Add 25 cents to points West.

PEN-OX-SOL is remarkably efficient for sur face or immersion cleaning.
PEN-OX-SOL is non-inflammable harmless to normal skin and safe to use.
PEN-OX-SOL IS FREE FROM MURIATIC SULFURIC, NITRIC OXALIC ACID OR CYANIDE.
PEN-OX-SOL prepares the surface for paints and finishes and increases the bond.
PEN-OX-SOL cleaned equipment will not contaminate food products.
PEN-OX-SOL has no superior for Auto-body and large area cleaning.

Send check or M.O., 12 cents extra for C.O.D.
GUARANTEED EQUAL TO ANY AT ANY PRICE OR MONEY BACK. *PEN-OX-SOL (TRADE-MARK)
U. S. DETERGENTS CO., 338 CANAL STREET, NEW YORK CITY, N. Y.

minum alloy, alclad, polished steel, cadmium plated steel, stainless steel, polished copper or magnesium alloy.

Turco Stripper L-595 acts so rapidly that the "lifting action" starts almost immediately upon application. Varnish, lacquer and some enamels require a maximum time of five minutes for complete removal, while the most obdurate baked enamel requires not more than 15 minutes.

Steel-Grip Woman's Work Glove

A work glove designed for women in industry who require a flexible, comfortably fitting, but sturdy and economical general purpose glove has been placed

Steel-Grip Woman's Work Glove

on the market by Industrial Gloves Company, 722 Garfield Blvd., Danville, Illinois.

Made of lightweight horsehide, the Steel-Grip Woman's Work Glove is said to wear exceptionally well even on the toughest job, yet remains soft and flexible. It is made in three sizes—small, medium, and large—to insure perfect fit and comfort. It has an open back to provide coolness, as well as extra flexibility. An elastic web band across this opening in the back keeps the glove snug-fitting throughout its entire life. On the thumb and first two fingers is a patch—an extra thickness of leather that will not only add to the protection and safety of the operator, but will provide many extra hours of glove service. A two-inch band of leather extends up over the wrist to provide protection for that vulnerable spot.

This new glove may be purchased in pairs, all rights, all lefts, or any combination of rights and lefts to the dozen pairs at no additional cost.

Atlas Improved Model LWH Platform Truck

Illustrated herewith is the Atlas Improved Model LWH Platform Truck which is now being manufactured by The Atlas Car & Mfg. Co., Cleveland, Ohio. Outstanding design features include powerful and sturdy one-piece driving axle, wiring panel cover, side plates covering driving unit, safety guards on operator's platform, truck type semi-elliptic leaf springs for cushioning road shocks, fully ventilated battery box, which is removable as a complete unit, and electric arc welded steel frame.

The truck is provided with two-wheel steer, with vertical operating lever supplied as standard equipment. Driving and trailing wheels are of disc type and are made of malleable iron. Driving wheels are mounted with ball thrust bearings

SPECIFICATIONS!

+

PLUS

Adaptation of formulae to the individual requirements of busy war contractors.

Within specification limits there are many possibilities of improvement in speed, workability, and freedom from rejects.

This PLUS factor is worth considering. We'd like to tell you more about it.

The Varnish Products Co.

Cleveland, Ohio

Atlas Improved Model LWH Platform Truck

for short periods.

The driving unit of the Model LWH truck is lubricated by combination splash and oil duct system in oil-tight housings. Suitable drainage and filling level plugs are provided. Universal joints, steering connections, and other bearings are lubricated by Alemite hydraulic high pressure grease fittings.

to ensure easy steering. Steering pins of driving wheels are located exactly on center line of wheels.

The brakes of the Atlas Improved Model LWH Platform Truck are of an external contracting type with two shoes, which are automatically applied by spring pressure when operator releases foot pedal.

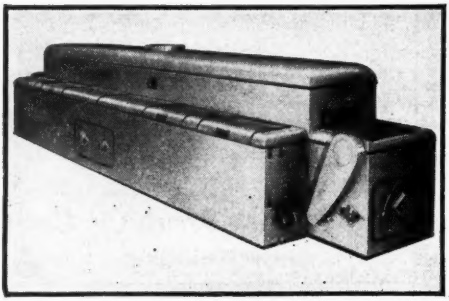
The controller of the truck is a totally-enclosed drum type with rolled copper renewable segments and drop forged copper self-aligning finger tips, which are reversible, thus providing double life. Three speeds forward and reverse can be obtained by means of the controller. A brake interlock switch built into the controller automatically disconnects electrical circuits when brakes are applied.

The Atlas Improved Model LWH Platform Truck, which has a machinery blue (dark gray) finish, is provided with a checkered steel load platform and rigidly constructed operator's platform. The motor of the truck is a General Electric, series-wound, totally-enclosed, ball bearing, slow speed, high torque, 24/36-volt unit with 400 per cent overload capacity

Watson-Standard Lacquers for Food Containers

Six new lacquers have been announced by Watson-Standard Co., 235 Galveston St., Pittsburgh, Pa., for use on blackplate steel food containers to conserve priority tin and terne plate. The materials are gold color, applied by roller coating to a thickness of about 9 mm. Pfund gage. Most of them are baked at 360 to 375 deg. F. for 17 minutes.

No. V-1823 material is a sanitary, odorless and tasteless lacquer for the interior of food cans and closures. No. V-1850 is an interior material for crowns. It resists action of alkalies used in pasteurizing crowns, has good fabrication and processing ability. No. V-1850-A withstands fabricating, resists sterilizing and weak acids. No. V-1850-B is a material with protective and decorative properties. No. V-1850-C resists processing at 250 deg. F. for one hour and is a general-purpose sanitary material. No. V-1850-D is a decorative material that produces a clear gold finish. It can be specified with "slip" qualities as a finish coat or without "slip" to use as a base coat for lithography.



HYDRO-FLOW
Industrial Washing Machines

Streamlined design. Hidden motors, pumps and pipes are easily assembled. Piping and nozzles located to insure thorough cleansing of all surfaces. Rugged and efficient pressure pump. Corrosion resistant spray nozzles—from mist to open stream. Monorail, Belt or Gravity type conveyors designed to carry any shape or size material. Variable speeds on conveyor drive synchronize production.

International Conveyor & Washer Corp.
Write for circular.
640 E. FORT ST. DETROIT, MICH.

Bancroft Automatic Chemical Sprinkler System

An automatic chemical sprinkler system designed particularly for extinguishing fires in or near furnaces, boilers, oil burners, and various places in factories such as storage rooms, stairways, and so on, is now being manufactured by the Bancroft Chemical Sprinkler Co., 82 Foster St., Worcester, Mass. The principle involved is similar to that of the standard water sprinkler

Bancroft Automatic Chemical Sprinkler System

system except that a chemical fire-extinguisher liquid instead of water is employed. The liquid, a patented formula, is said to be unusually effective in use, being capable of extinguishing magnesium fires.

The operation of the Bancroft Chemical Sprinkler System is automatic. By means of a pressure switch controlling the motor, the air compressor of the system maintains a constant pressure on the extinguishing liquid in the tank and pipe line. In the event of a fire, the heat from same melts a fuse link, thus causing the sprinkler head to open and thereby permitting the extinguishing liquid, under pressure, to be sprayed out onto the fire. Immediately upon contact with the flame or heat, the extinguishing liquid vaporizes, thereby forming a heavy blanket of vapor which consumes the heat, displaces the air, and stops combustion. Actual tests, it is claimed, have resulted in fires being extinguished in 60 seconds or less.

Cotoid

A corrosion-proofing liquid which dries to form a protective coating has been placed on the market by the Lithgow Corp., 333 W. 40th Pl., Chicago, Ill. This material is to be marketed under the name of "Cotoid." It is a liquid material based on synthetic resins for application by brushing, spraying, dipping, on the interior as well as the exterior of tanks handling corrosive solutions, acids, alkalies, and on the walls of structural work and in rooms subjected to high humidity, acid fumes, and so on.

The coating withstands temperature to 220 deg. F. in contact with air or vapor, to 140 deg. F. when submerged. Recent improvement includes an increase over previous amount of solids content for spray application with an equal amount of thinner, and addition to the line of a material that dries by baking. The coating is odorless and tasteless.

Application follows a cleaning operation to remove moisture, rust, scale, and oil from the surface to be protected. A Cotoid primer is then applied and permitted to air dry for six hours or more. The material is applied over the primer in three coats, when following recommended practice, each coat being allowed to air dry for twelve hours prior to placing the next one. Heat drying or forced-air drying is necessary when application is being made on the inside surfaces of tanks. Ventila-

more speed!
All parts are handled faster thru metal treating processes with
ROLOCK INDUSTRIAL BASKETS and CRATES
Designed and built for more economical handling, speedy unloading, lighter weight, quicker heat penetration, faster acid drainage and longer life.
Send specifications
ROLOCK INC
1400 KINGS HIGHWAY E., FAIRFIELD, CONN.

tion to protect workers inside the tanks during the application also is required. Available colors are white, gray, and black.

Hygrade Sylvania P-7 Fluorescent Extension Cord Light

Designed in answer to a request for a small, cool light for close work and inspection in the restricted areas of bomber wings, a fluorescent extension cord light designated as the P-7 is now being marketed by the Hygrade Sylvania Corp., Lighting Division, Ipswich, Mass. The unit is of rugged, lightweight, and compact design and is said to be readily adaptable to all types of extension cord service.

Outstanding features of the Hygrade Sylvania P-7 Light are cool light source, easy lamp replacement, low wattage, and low brightness. The latter feature is said to be particularly desirable not only for reducing eye fatigue resulting from glare to a minimum but also for greatly increasing the effective illumination on work. An added feature of the light is a grille sturdily constructed of heavy gauge steel for protecting the fluorescent lamp.

The Hygrade Sylvania P-7 Fluorescent Extension Cord Light is designed for operation on 110-125 volts, 60 cycle alternating current. The unit is 9½ in. long over-all, 1 in. wide over-all, 1¾ in. high over-all and has an average weight of 2½ lbs. The chassis and end caps are finished with gray Miracoat baked enamel and the reflector and grille with white Miracoat baked enamel. The light is furnished complete with ballast operating equipment and 12 feet of cord.

Hygrade Sylvania P-7 Fluorescent Extension Cord Light

Lewis-Shepard 40-Foot Telescopic "Victory" Stacker

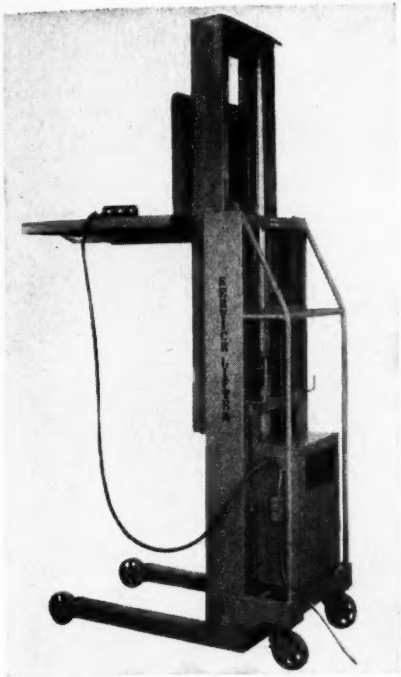
The illustration shows a 40-foot telescopic portable elevator for construction and maintenance work which has been brought out by the Lewis-Shephard Sales Corp., 245 Walnut St., Watertown, Mass. General uses of the unit, which is known as the Lewis-Shepard "Victory" Stacker, include installing sprinklers, wiring, lighting fixtures, and so on.

The stacking unit shown has a capacity of 1,500 lb. and is 40 ft. 4 in. high over-all. Lifting height of the unit is 37 ft. 6 in. and lifting speed is approximately 30 ft. per minute. A push-button control is provided for controlling raising and lowering of load.

WE RECOVER YOUR
SOLVENTS and THINNERS
from Sludge, Waste, Wash, Spoiled Lacquers, etc.
AND SAVE YOU MONEY
Each shipment—one drum or a carload—receives PROPER and SEPARATE TREATMENT.
Solvents recovered by the Lofgren Process.
Write to:
SOLVENTS RECOVERY SERVICE, Inc.
1019 Broad St. Newark, N. J.
or
HAMMOND CHEMICAL SERVICE, Inc.
241 Brunswick St. Hammond, Ind.

For a real good polishing job use
KEYSTONE EMERY
TURKISH — NAXOS — AMERICAN
KEYSTONE EMERY MILLS *Write for Sample* 4316 Paul St., Phila., Pa.

The unit is equipped with a platform 36 in. long x 72 in. wide and 3 h.p. 110-volt d.c. hoisting mechanisms. The stacker is also provided with a slack cable platform locking device. Power for the hoisting mechanism is supplied by a d.c. generator mounted on the truck.



Lewis-Shepard 40-Foot Telescopic "Victory" Stacker

The Lewis-Shepard Victory Stacker is also available with other capacities, lower collapsed height, and various platform sizes.

Corrosol No. 26

Through its many years of research and experimentation in the rust-prevention field, the International Rustproof Corporation, 12511 Plover St., Cleveland, Ohio, has developed many products that have materially aided in stopping the scourge of corrosion which is responsible for millions of dollars of damage to ferrous metals.

The war itself has presented the world with new probelms in corrosion prevention and control. Because of storage and transportation problems, the manufacturer is faced with additional difficulties of corrosion control.

Corrosol No. 26 is a specific solution for a specific problem. The pickilng and cleaning room has presented the tool and other ferrous industries with problems that demand a positive corrosion and blemish-proof method. Corrosol No. 26 does not promote the growth of corrosion after treatment but instead leaves the metal in a clean, passive condition. Furthermore, because Corrosol No. 26 does not act upon the metal itself, it does not dull the cutting edge of tools. Corrosol No. 26 not only removes rust, but also eliminates blemishes, burn marks, and so forth.

Corrosol No. 26 is a simple product to use. It is used in a cold solution. It is said to be harmless to the workmen and is non-inflammable.

Cortland Emery Aggregate Flooring Material

Designed to produce nonskid floors either when wet or dry, a flooring ma-

Speed up your war orders with

BLACK-MAGIC

"the one-bath process"

Only 40% of the time and 40% of the cost of any two-bath process and we guarantee equal penetration and better rust-proofing.

BLACK-MAGIC is approved for many Government operations.

Write for portfolio of complete information on Black Magic and its related products.

The Mitchell-Bradford Chemical Co.

BRIDGEPORT, CONN.

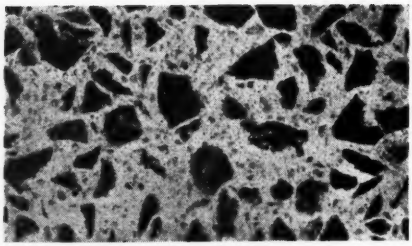


Illustration Showing Surface of Cortland Emery Aggregate Flooring Material

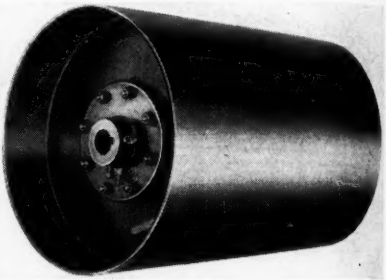
terial consisting of a mixture of scientifically graded large and small sharp hard particles of mineral emery is now being offered by the Walter Maguire Co., Inc., New York, N. Y. To apply, the material, which is known as Cortland Emery Aggregate, is mixed with Portland cement and water and spread over the surface of the floor.

The nonslip surface provided by the material is said to improve with use since the rough emery particles of the mixture are exposed by wearing away of the cement, thus greatly increasing the gripping action afforded by the material. Where loads are moved on trucks by hand, great pushing traction is said to be obtained. Heavily loaded trucks, it is claimed, will not destroy a Cortland Emery Aggregate surface since the hard emery patricles of the material are unusually resistant to wear.

In addition, Cortland Emery Aggregate Flooring Material is designed to greatly increase the load-bearing quality of a floor, the material supporting a load of more than 14,000 lb., it is claimed. High tensile strength (resistance to pulling apart) is an additional feature claimed for the material.

"American" Type "N" Steel Conveyor Pulley

Designated as the Type "N", a solid-type steel pulley for use with belt conveyors is announced by The American Pulley Co., 4200 Wissahickon Ave., Philadelphia, Pa. Light in weight, the pulley is constructed of rolled steel,



"American" Type "N" Steel Conveyor Pulley

with ends enclosed to prevent spilled materials, dust, water, and so on, from accumulating inside. Interchangeable hubs assure quick and easy mounting of pulley.

The "American" Type "N" Steel Conveyor Pulley is available in diameters of 6 to 36 inches with crown or flat face construction. The American Steel Conveyor Pulley can also be obtained in a split type designated as the Type "O".

Westinghouse 18-Inch Searchlight

Designed for use around industrial plants, ordnance plants, aboard ships,

PREZAINT

A pre-treatment of Zinc and similar metals before Painting

Particulars on Request

INDUSTRIAL CHEMICAL PRODUCTS CO.

DETROIT

Milwaukee **Ft. Wayne**

BETTER PLATING, LESS COST!

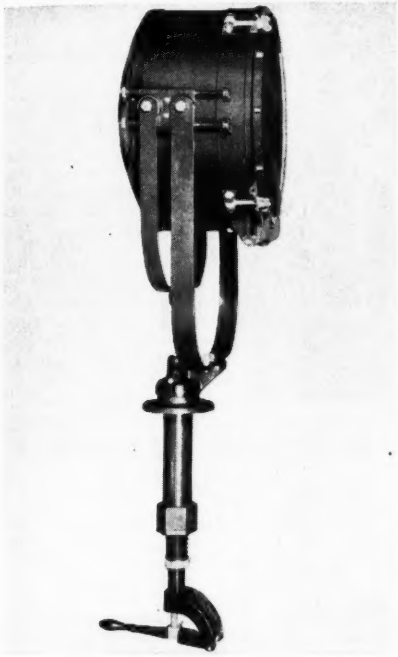
"MGC" ELECTROPLATING EQUIPMENT

Write for Interesting Details TODAY!

MOTOR GENERATOR CORP., HOBART SQ. JX PF-92 TROY, OHIO

and so on, an 18-inch incandescent searchlight with pilot house control or flat base is announced by the Westinghouse Lighting Division, Cleveland, Ohio.

Intense beam concentration is obtained by means of a primary precision ground and polished silvered-glass reflector and a metal secondary reflector designed to permit continuous operation with lamps up to and including 1,500 watts. A tandem reflector shield mounted in the center of the primary reflector



Westinghouse 18-Inch Searchlight

is said to eliminate all secondary heat concentration on the lamp bulb. Heat dissipation is by radiation, thus permitting the use of a dust-tight enclosure.

The body and back sections of the housing are of sheet steel. The door and door frame are of cast iron with integrally cast hinge and lathe lugs. The door is clamped in position against a weather-tight heat-resisting gasket or graphited asbestos.

The lens is of heat and impact-resisting polished glass mounted against a weather-tight gasket and held in position by steel spring clips. The primary reflector is a 19-inch parabolic commercial-precision mirror coated with silver and sealed by an electrolytic coating of copper and synthetic material. The secondary reflector consists of polished metal, designed to provide high reflectivity.

The body is supported in a steel bow with locking handles to position the luminaire at any fixed elevation and rotation. The socket assembly is a standard mogul bipost-type rated at 50 amperes, 600 volts. The socket assembly is normally fixed in position but is independently adjustable for elevation and rotation.

All castings and sheet parts of the Westinghouse 18-Inch Searchlight are finished with one coat of red lead oxide and two coats of weatherproof green paint. Hardware is galvanized or plated.

Binks Automatic Shell Coating Machine

The illustration shows a shall coating machine for automatically spraying the inside and outside of 75 to 105 mm. shells at a rate of from 200 to 500 per hour which is now being built by the Binks Mfg. Co., 3114-40 Carroll Ave., Chicago, Illinois.

-for Fast-Finishing

"INDIAN BRAND" POLISHING ABRASIVE

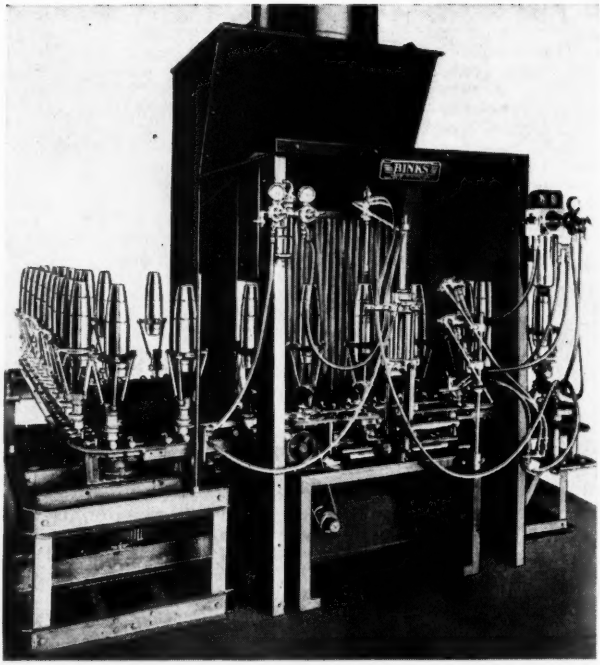
For nearly forty years we have been producers and refiners of abrasive grains, serving the industry with a strictly quality product for all particular abrasive applications. Accurately Graded — Thoroughly Cleaned — Greater Capillarity — Longer Wear.

Send for trial lot—FREE!

Indian Brand Polishing Abrasive
Hecco Brand American Emery

THE HAMILTON EMERY & CORUNDUM CO.

Chester, Massachusetts



Binks Automatic Shell Coating Machine

completely spraying the inside. Following this operation, the shells move away from the oscillating mechanism and continue on the conveyor for the required time to complete an air dry. When the shells are dry, they are unloaded and packed for shipment to shell loading plants.

The Binks Automatic Shell Coating Machine is equipped with an ingenious device known as a "Skip Spray" unit, which is so designed that should a shell be missing on the conveyor, the gun will not spray, thereby wasting no paint.

In use, the shells are loaded on a moving conveyor in a specially designed work holder, which holds the shells in position. As the shells pass in front of the Binks Water Wash Spray Booth, an oscillating mechanism engages the spindle of the work holder, rotating the shells in front of the automatic spray guns, which spray the exteriors of the shells. The shells then move, still rotating, to a position where a pneumatic spray gun plunges down into the interior cavity of each shell as it rotates,

McKeon's

"Liquid Sulphur"

TRADE MARK REG'D

FOR

REMOVING COPPER PLATE

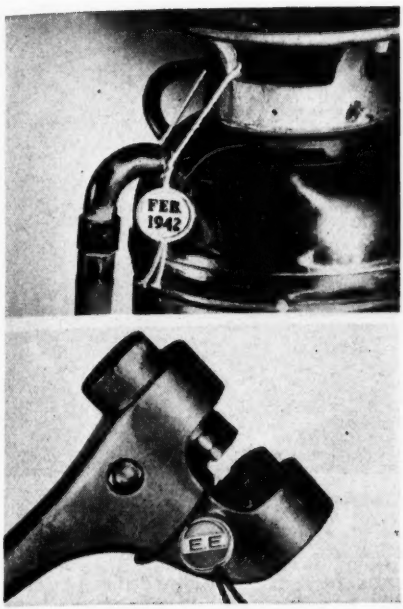
Sample and Cooperation FREE

Sulphur Products Co., Greensburg, Pa.

Stoffel Safety and Inspection Seal

A completely tamperproof safety and inspection seal for sabotage prevention is now being manufactured by the Stoffel Seals Co., Inc., 188 Water St., New York, N. Y. The seal, which also provides for secret identification markings, is said to guard and fully guarantee against any tampering, alteration, or substitution of parts or products. It consists of two components; namely, a pre-shaped metal seal-cup and individualized identification disc, which is multi-color printed.

The great advantage of multi-color discs is that, in addition to carrying complete identification information, basic colors serve as instant indicators of time element, process, location or priority of sealed object, and so on. Further markings, such as inspector's number and department number, can be incorporated in the pliers used in sealing so that at the moment of closing the pliers these markings or numbers are indented into the identification disc.



Stoffel Safety and Inspection Seals in Use

Stoffel Seals can be permanently applied with either string, thin cord, or two-ply wire, which ever is most suitable to the sealing operation with the lightweight sealing pliers. Once the two component parts are locked, the seal cannot be tampered with without immediate visual detection.

Stoffel Safety and Inspection Seals are already said to be effectively aiding National Defense in keeping fire extinguishers of plants safe from interference after periodical inspection without immediate visual detection; in sealing inspected parts for army material for protection until they reach the assembly line, and in sealing drums and containers for similarly effective protection.

Shriver Diaphragm Pump

A newly designed pump added to the line of Shriver Diaphragm Pumps is the streamlined top feed, bottom discharge unit which is adapted particularly for handling slurries or suspensions which contain a high percentage of crystalline or quick settling solids which may be corrosive, abrasive, heavy or valuable, delicate or hazardous. The pump is being manufactured and marketed by T. Shriver & Company, 808 Hamilton St., Harrison, New Jersey.

The material is fed into the upper manifold through the ball valves and into the heads at each end of the pump in a clean sweeping motion, thereby assuring that with each forward motion of the diaphragm covered piston, the material is forced out through the lower pair of ball valves and out through the lower manifold. This does not permit settling or accumulation of solids in the pump heads.

Positive displacement of the material is said to be effected by means of the double acting pistons which are always immersed in a bath of lubricating oil. Since the working mechanism is entirely separated from the liquid heads by rubber diaphragms, there can be no effect of the material on the mechanism. Thus the only parts of the pump which need be made of whatever metal or rubber covered metal that is best suited to the conditions are the liquid heads, ball valves and manifolding.

An interesting feature of the pump is the interchangeability of the valve manifolds so that the pump may be fed from the bottom and discharged at the top, if

THE ADIRONDACKS GORE MOUNTAIN CRYSTAL GARNET ORE

ABRASIVE GARNET

For
Abrasive Paper and Cloth
Grinding Wheels
Sand Blast
Minus 300 Mesh for
Polishing and Lapping
Grades for Barrel Finishing

Ample Stocks Insure Prompt Shipment

BARTON MINES CORPORATION
NORTH CREEK, WARREN COUNTY, N. Y.

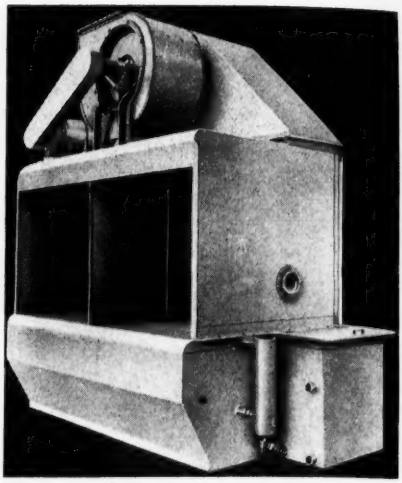
this arrangement is so desired.

The pump is made in a complete range of capacities from 1 to 100 g.p.m. and for delivery pressure up to 100 p.s.i. and a suction lift as high as 18 ft. Any type of motor drive may be applied.

Industrial Improved Hydro-Whirl Magnesium Dust Collector Booth

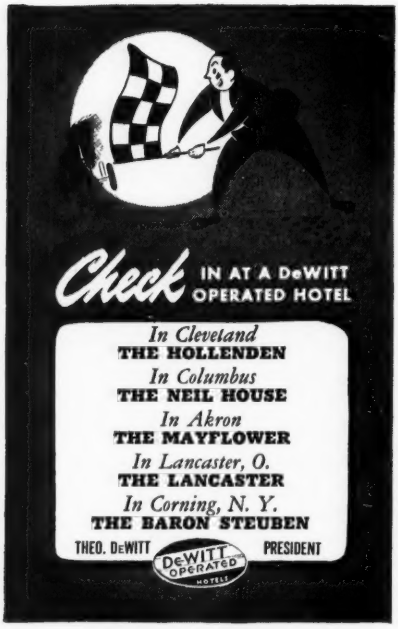
The illustration shows the improved Hydro-Whirl Magnesium Dust Collector Booth for use in performing magnesium grinding, buffing, and polishing operations which is now being marketed by Industrial Sheet Metal Works, 630 E. Forest Ave., Detroit, Mich. According to the manufacturer, the factor of safety in this particular booth has been greatly increased over models formerly offered.

Instead of being made of steel, the bench-grating of the compartment where operations are performed is made of hardwood so as not to produce sparks if struck with a grinding wheel or tool. Thus, the possibility of having sparks ignite the magnesium dust created by the grinding, buffing, or polishing operations performed within the booth is said to be removed and the danger of fire practically eliminated. As an added protection against spark ignition, the booth sections are lined with Masonite.



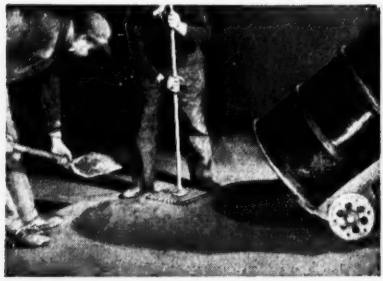
Industrial Improved Hydro-Whirl Magnesium Dust Collector Booth

An automatic control maintains the water level at a uniform height in the tank below the bench-grating, thus eliminating the possibility of the tank becoming dry and thereby endangering the safety of the operator.



Flexrock "Instant-Use Resurfacer"

Designed to permit immediate travel after application, a material for patch-



Flexrock "Instant-Use Resurfacer" Being Applied to Floor

ing or overlapping rutted floors, to be known as Flexrock "Instant-Use Resurfacer," has been placed on the market by the Flexrock Co., 2315 Manning St., Philadelphia, Pa. The material is said to improve in smoothness and compactness under the wheel of constant traffic.

According to the manufacturer, Flexrock Instant-Use Resurfacer adheres to old concrete or wood and bonds to a feather-edge. Trucks which are used over a floor of this material are said to start easily after standing.

Bracket for Eclipse Mixer

The Eclipse Air Brush Co., 400 Park Ave., Newark, N. J., has announced the addition of two V-shaped brackets to hold its direct drive air motored agi-

Bracket for Eclipse Mixer

tators. These brackets are made in two sizes, to fit 30 and 50-gallon drums.

There is a screw clamp at the side of the bracket to allow for variations in the sizes of the drums, and to insure steadiness of the Pneumix agitator. The mixer can be adjusted to any angle.

The use of the Pneumix with the new holder does not in any way change the spark-free operation of the mixer which retains all its properties of variable speeds, light weight, quiet, and splash-free performance.

Opportunity Section

FOR SALE

43—1"x14", glued polishing wheels, each made of 4 sections of 20 ply, full disc, ¼" spirally sewed cotton.
22—¼"x14", glued polishing wheels, made from 20 ply, full disc sections of cotton, ¼" spirally sewed.
40—16" sections of 20 ply, loose cotton buffs, made from 92x96" cotton sheeting, full disc.
80—16" sections of 20 ply, full disc, ¼" spirally sewed, 92x96" cotton sheeting. All the above have 1¼" Arbor holes.
128 lbs., Divine Bros. best grade of ground glue, for coating polishing wheels.
400 lbs., #120 Grain, Philadelphia Abrasive.
200 lbs., #140 Grain, Philadelphia Abrasive.

Present prices of these materials are $358.00. They are now offered at $230.00. F.O.B. Rochester.

With the exception of the first two items all of the above enumerated materials are new, and the cotton wheels easily could be made into all Buffs, or Polishing wheels.

Clark Hardware Manufacturing Co.
20 Gladys Street Rochester, N. Y.

THIS Opportunity Section is available for classified advertisements featuring equipment, employment, business opportunities, etc., in the industries devoted to the cleaning, plating, polishing and finishing of metals. For advertising rates and other information address:

PRODUCTS FINISHING
431 Main Street • Cincinnati, Ohio

FOR YOUR Catalog LIBRARY

To obtain copies of the catalogs listed here, indicate on the coupon the number of the item in which you are interested and mail as directed.

1. Deoxidine

A metal preparation compound which is said to clean steel for painting, eradicate dust, and preserve paint is described in a folder now being issued by American Chemical Paint Company, Ambler, Pennsylvania.

2. Production Weapons for War Industries

The Fostoria Pressed Steel Corporation, Fostoria, Ohio, is issuing a 32-page catalog presenting in detail the story of their products, organization, installation photos, and so on.

3. Porcelain Enamel — A Non-Critical Finish for Wartime Uses

This catalog now being distributed by The American Rolling Mill Co., Middletown, Ohio, interprets porcelain enamel as a finish for various war products and industrial applications.

4. Penotrite

The General Solvents Sales Co., Inc., 34 State St., Rochester, N. Y., is issuing a series of folders on Industrial Penotrite, a material designed for general degreasing purposes.

5. Shell Cleaning With DuBoy Products

A data sheet describing the soaker tank method with Actex 200, the solvent method with Actusol, and the industrial washing machine method with Actex 200 is now being distributed by The DuBois Company, 1120 W. Front St., Cincinnati, Ohio.

6. U. S. Stoneware Bulletin "D"

A summarization of all the manufacturing activities in the ceramic, synthetic, and alloy industries is contained in Bulletin "D" now being issued by U. S. Stoneware Co., Akron, Ohio.

7. Rolock Wire Mesh Baskets

Construction specifications and applications of Rolock Wire Mesh Baskets are contained in a 12-page catalog which is now beingissued by Rolock, Incorporated, 1350 Kings Highway East, Fairfield, Connecticut.

8. Heil Process Equipment

The construction of process equipment with chemical resistant materials is described in a catalog now being issued by Heil & Company, 12903 Elmwood Ave., Cleveland, Ohio.

9. Despatch Laboratory Ovens

Bulletin No. 105 now being issued by Despatch Ovens Company, 722 Central Ave., Minneapolis, Minn., describes fully a new line of Despatch Chemical Laboratory Forced Draft Ovens.

10. Data on Production Facilities

The Kirk & Blum Mfg. Co., 2816 Spring Grove Ave., Cincinnati, Ohio, is now issuing a catalog containing an abundance of information on the facilities of this company which are available to those who require sheet metal fabrication.

11. High Pressure

A new house organ containing a review of recent developments in fire protection and in the handling of compressed gases is now being published by Walter Kidde & Company, Inc., 631 West St., Bloomfield, New Jersey.

12. General Industrial Protective Coatings

General Industrial Finishes, 100 Sixth Ave., New York City, is now issuing a beautifully illustrated 16-page catalog describing protective metal coatings.

13. Prep Products

Four materials which help to provide a firm and lasting bond between all kinds of metal surfaces and paint finishes—known as Galvaprep, Prepwash, Preprite, and Metalprep—are described in a folder now being issued by Neilson Chemical Co., 6564 Benson St., Detroit, Michigan.

14. Curran Naphtha Substitute

The Curran Corporation, 6 Pleasant St., Malden, Mass., is now issuing a data sheet on Naphtha Substitute, explaining the properties and application of this cleaning material.

15. Hard Chromium Plating

A 16-page data bulletin summarizing the applications of industrial chromium plating is now being issued by United Chromium, Inc., 51 East 42nd St., New York City.

16. Sarco Temperature Regulators

Bulletin No. 600 which is now being issued by Sarco Company, Inc., 475 Fifth Ave., New York City, illustrates and describes Sarco Temperature Regulators for heat control in industry.

17. Lixol Metal Cleaner

A solvent emulsion-type metal cleaner known as "Lixol" is described in a booklet which is now being issued by Cowles Detergent Company, 7016 Euclid Ave., Cleveland, Ohio.

18. Burring With the Lea Method

An eight-page bulletin covering the Lea method of burring is now being distributed by Lea Manufacturing Co., 22 Cherry St., Waterbury, Connecticut.

19. Spray Booth Cleaning Compounds

Triad WS and WSF spray booth cleaners for use respectively in booths where oil base paints and enamels are sprayed are described in a new leaflet issued by Detroit Rex Products Company, 13017 Hillview Ave., Detroit, Michigan.

20. Metal Cleaning in War Time

The Magnus Chemical Company, Inc., 208 South Ave., Garwood, N. J., manufacturer of industrial cleaning materials, emulsifying agents and metal working lubricants, is now issuing this new 50-page, illustrated handbook.

21. Brightboy for Polishing and Finishing

An eight-page booklet describing Brightboy; what it is, what it does, is now being issued by Brightboy Industrial Division, Weldon Roberts Rubber Co., 351 Sixth Ave., Newark, New Jersey.

22. Metal Parts Cleaning Equipment

Colt Autosan Metal Parts Cleaning Equipment is described in a 12-page catalog now being issued by Colt s Patent Fire Arms Mfg. Company, 1933 Van Dyke Ave., Hartford, Connecticut.

PRODUCTS FINISHING
431 Main St., Cincinnati, Ohio

I am interested in receiving the following literature reviewed in your September issue.

No...... **No.**..... **No.**..... **No.**..... **No.**.....

(Insert numbers denoting literature you want.)

Name ..... Title.....

Company .....

Company Address .....

City ..... State.....

Index TO ADVERTISEMENTS

Alvey-Ferguson Co., The 13
American Chemical Paint Co. 5

Barton Mines Corporation 75
Blakeslee & Co., G. S. 57

Clark Hardware Mfg. Co. 77
Colt's Patent Fire Arms Mfg. Co., Autosan Machine Division 3
Cowles Detergent Co. 8

Despatch Oven Co. 35
Detroit Rex Products Co. ..... Fourth Cover
DeWitt Hotels, Incorporated 76
Du Bois Co., The 39
Du-Lite Chemical Corporation 25

Egyptian Lacquer Mfg. Co. 6

Hamilton Emery & Corundum Co., The 73
Hanson-Van Winkle-Munning Co. 15
Harshaw Chemical Co., The 64
Howard Engineering & Mfg. Co. 47

Industrial Chemical Products Co. 72
Industrial Sheet Metal Works, Inc. 21
Industrial Washing Machine Corp. 55
International Conveyor & Washer Corp. 68

Keystone Emery Mills 70
King, John 65
Kirk & Blum Mfg. Co., The 37

MacDermid Incorporated 33
Mahon Co., The R. C. ..... Third Cover
Metalwash Machinery Co., Inc. 53
Michigan Chrome & Chemical Co. 41
Minnesota Mining & Mfg. Co. 17
Mitchell-Bradford Chemical Co. 71
Motor Generator Corporation, Division of Hobart Bros. 72

Neilson Chemical Co. 2
Norton Company 4

Oakite Products, Incorporated 1

Packer Machine Co. 63
Pennsylvania Salt Mfg. Co. 31
Philadelphia Quartz Co. 51
Procter & Gamble 59

Rackote Division, The, Wyandotte Paint Products Co. 29
Ransohoff Incorporated, N. 45
Rolock Incorporated 69
Roxalin Flexible Finishes, Inc., Second Cover

Solvents Recovery Service 70
Sulphur Products Co., Inc. 74
Sun Oil Co. 27

Udylite Corporation, The 19
U. S. Detergents Co. 66
U. S. Treasury Department 43

Varnish Products Co., The 67
Vonnegut Moulder Corporation 49

PRODUCTS FINISHING
PUBLISHED BY GARDNER PUBLICATIONS, INC.
431 MAIN STREET • CINCINNATI • OHIO

NTS
.....53
.....41
.....17
.....71
.....72
..... 2
..... 4
..... 1
..... 63
.....31
.....51
.....59
.....29
.....45
.....69
d Cover
.....70
.....74
.....27
.....19
.....66
.....43
.....67
.....49
ING
S, INC.
OHIO

Products Finishing

CLEANING

PLATING

POLISHING

FINISHING

SEPTEMBER • • 1942

NOW You Can Wash 'Em Down

With Any Kind of Gas!

"FACTS ABOUT GOVERNMENT FINISHES"

You will find our file folder "Facts on U. S. Government Finishes" an invaluable source of information on most of the Army and Navy specification finishes. A set is yours for the asking — write, we'll send it by return mail.

WATCH ROXALIN IN AVIATION

. . . New Protective Cable Coating Withstands the Attack of Aromatic Gasolines.

SOAKED IN 100 OCTANE GASOLINE . . .

After only 24 hours, a standard ignition cable coating has allowed penetration of fuel through the film—rubber insulation is partially dissolved and swollen to such an extent that cotton braid and lacquer film has burst. Roxalin's new high tension ignition cable coating is unaffected after 10 days immersion.

ON distant battle fronts, motors may have to be cleaned of grease and oil with any solvent available. If only high octane gasoline is at hand it would rapidly penetrate conventional ignition cable coatings. Insulation braid and rubber are soon destroyed and complete rewiring of the ignition system becomes necessary.

Roxalin's new high tension ignition cable coating helps keep 'em flying because it is insoluble and impermeable in high aromatic motor fuels. This is accomplished without sacrificing its outstanding resistance to high and low temperatures.

A new cable coating probably is not your finishing problem. We cite this Roxalin development because we feel it is typical of the service you can expect if you will give your specific finishing problem to our laboratory.

ROXALIN *Flexible* FINISHES
INCORPORATED
ELIZABETH • NEW JERSEY

Photo courtesy United Airlines

Assured by Fast, Thorough

OAKITE DEGREASING

The FIRST STEP in getting a satisfactory black finish . . . one that has the requisite uniform, corrosion-resisting properties . . . is THOROUGH surface degreasing. All smut, oil, grease and dirt must be removed. The metal surface must be made CHEMICALLY CLEAN!

Gives You Results You Want . . . Economical

Because effective, fast-working Oakite materials are specially designed for preparing iron, steel, aluminum, brass, zinc, cadmium, or copper surfaces for black finishing, they will give you the satisfactory results you want. In addition, they will help you keep production moving smoothly . . . do it on a low-cost basis.

Are You Making These War Products?

If you would like help in applying black finishes on gun or airplane parts, automotive parts, instruments, bearings, gears, tools or other war products, let us give you the benefit of our wide, successful experience in this work. Write today . . . no obligation.

MANUFACTURED ONLY BY

OAKITE PRODUCTS, INC., 20 Thames St., NEW YORK, N. Y.

Representatives in All Principal Cities of the United States and Canada

OAKITE Specialized **CLEANING**

MATERIALS METHODS SERVICE — FOR EVERY CLEANING REQUIREMENT

Is Your Paint Problem A HEADACHE?

PREP PRODUCTS *will cure it-*

The Neilson Chemical Company maintains a staff of trained trouble-shooters who are capable of analyzing your cleaning and paint problems and recommending the proper remedy so that you will obtain effective cleaning, proper paint adhesion and approval of your paint job by the Government inspectors. IMMEDIATE delivery also!

METALPREP . . .
For metal cleaning, either by hand operation or semi-automatic cleaning systems.

GALVAPREP . . .
For preparing galvanized iron, galvanneal and other zinc-coated surfaces.

PREPRITE . . .
Forms a paint-receptive phosphate rustproof coating on iron and steel surfaces.

PREPWASH . . .
A safe, sure and economical cleaner and cleaning method for mechanical systems already in operation.

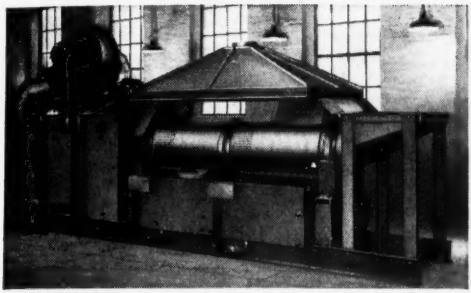
NEILSON CHEMICAL COMPANY

Windsor, Ont. Canada — **6564 Benson St., Detroit, Michigan** — Los Angeles Calif.

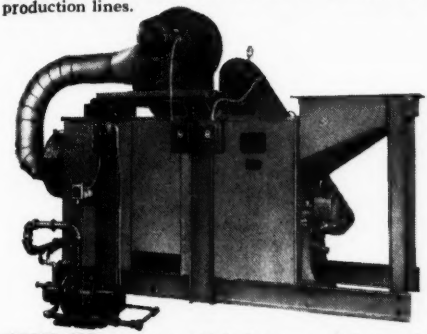
Write for Literature

CLEANING CARTRIDGE CASES!

..an important wartime job for Colt Autosans



MODEL 282—rugged, three-operation Revolving Drum Colt Autosan. Washes, rinses, dries—is reducing metal parts cleaning costs and time on hundreds of production lines.



MODEL 270—a compact Colt Autosan unit for continuous drying of small parts. Automatically feeds, dries and discharges parts in one operation.

Revolving Drum Colt Autosans, like the Model 282 shown at left, turn the cleaning of cartridge cases, bullet cores and other small parts that can be tumbled, into a speedy, low-cost production job. These sturdy Revolving Drum Models handle the cleaning and drying of small parts in bulk in one continuous operation—and turn out more work in less time. Send us a description of the kind, size and quantities of parts to be cleaned, the operations required—then Colt engineers will gladly recommend equipment best suited to your needs. It may be a Revolving Drum Model as illustrated or one of our Conveyor Models.

Do you have a copy of the new catalog of Colt Autosan Metal Cleaning and Drying Machines? It describes the basic Autosan models—gives dimensional drawings, operating details and other valuable information. Write for it today!

COLT'S PATENT FIRE ARMS MFG. CO., HARTFORD, CONN.

COLT AUTOSAN METAL PARTS CLEANING EQUIPMENT

Facts about
Metal Polishing

Cement in Polishing Wheel Set-up

FOR use with cement, Norton Company recommends E 138 Alundum "S" treated abrasive for 90 grit and coarser, and E 138 Alundum "B" treated abrasive for 100 to 240 grit.

If a wheel has been previously set-up with glue, it is absolutely essential that all traces of it be removed prior to applying a sizing coat of cement.

The cement should be applied as directed by the manufacturer.

Tests of cements, in the Norton research laboratories, have proved that the efficiency of the wheel head increased with the drying temperature and a decreasing humidity.

A final drying at 170° to 180° Fahrenheit with 50% or less humidity makes for optimum results. This is IMPORTANT. (Increased temperature alone will improve the efficiency of the wheel head to a lesser degree than when the high temperature is accompanied by a low humidity.)

NORTON COMPANY • **WORCESTER, MASS.**

G-142

NORTON ABRASIVES

Ships on the Production Line

ACP Products save time and step-up efficiency in Navy and private shipyards

Just as ACP DEOXIDINE helped make the mass production of automobiles possible . . . and as ACP RODINE boosted the efficiency and volume of steel production . . . so, today, these and other ACP Products are helping build the vital bridge of ships.

RODINE in pickling baths, saves both steel and acid and prevents pitting and burning of plates. It minimizes acid embrittlement, making plates easier to machine, bend and drill. DEOXIDINE is the time-tested acid cleaner. On aluminum ventilating ducts and superstructure sections, it removes oil, eradicates corrosion and neutralizes corrosion-producers. LITHOFORM chemically coats galvanized surfaces to prevent the characteristic blistering and peeling of paint.

All three have long served their apprenticeship with the growth of American Industry.

Among the other ACP Products are: FLOSOL, an exceptional soldering flux for steel, brass, copper, tin, terne plate, zinc and galvanized iron; KEMICK, a chemical paint that holds to and protects metal surfaces even when heated to redness; CUPRODINE copper coats steel by simple immersion.

These and other ACP Products are available to you in speeding production of the vital bridge of ships. The experience of the ACP laboratories in metal treating and finishing processes is at your service.

AMERICAN CHEMICAL PAINT CO.

MAIN OFFICE AND WORKS
AMBLER . . . PENNA

ACP

CHEMICALS ACP PROCESSES

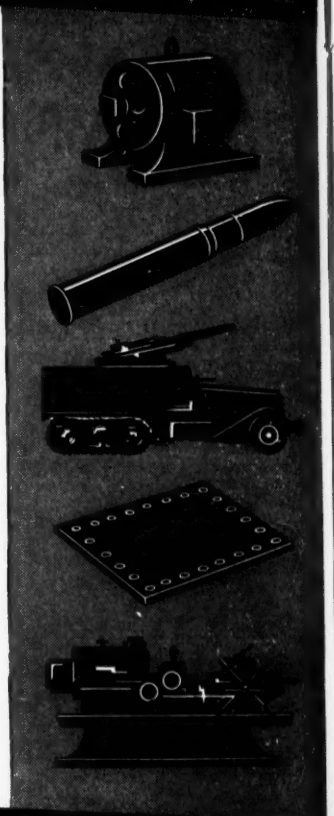
DETROIT, MICH., 6335 Palmer Ave., E.
CANADIAN BRANCH
WALKERVILLE . . . ONT

EGYPTIAN
Superior FINISHES
for Industry at War

EGYPTIAN SUPERIOR FINISHES will help you in producing war jobs with a maximum of protection and a minimum of difficulties. Speed and ease of application plus a durable finish will enable you to turn out your product faster and better.

We have swung into high gear to help you make a better, more efficient and longer lasting war product. Generations of experience as one of the oldest manufacturers in the finishing field and case histories of successful formulae are today going into the development of all types of finishes for war products with emphasis on U. S. Government Specification Finishes. It's our humble but important contribution to ultimate Victory.

Write us your specific requirements. It may be that we can help prevent costly delays, bottlenecks and rejects in your finishing department . . . Or we may enable you to cut some corners that will speed production and at the same time improve your FINISHED product . . . And there's no better way to build or sustain a reputation for post-war business than to produce the best for the war effort.



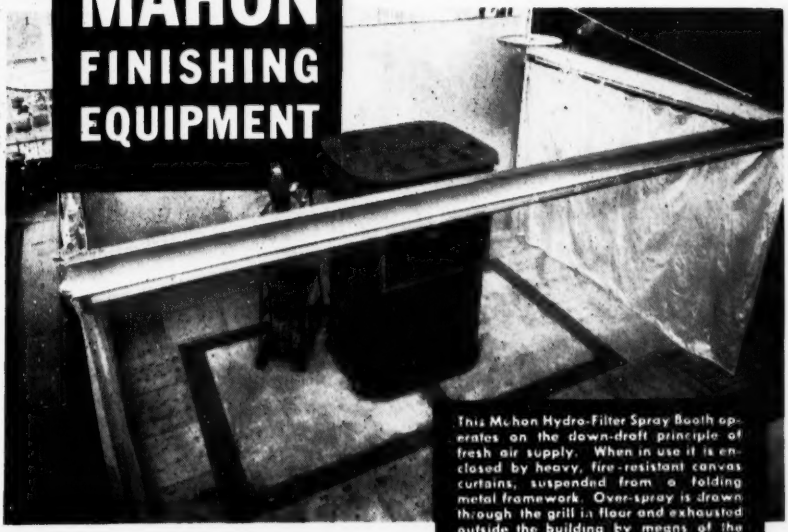
When writing please include allocation symbol.

EGYPTIAN FINISHES

THE EGYPTIAN LACQUER MANUFACTURING CO.
Rockefeller Center · New York

Built-to-the-Job

MAHON FINISHING EQUIPMENT



This Mahon Hydro-Filter Spray Booth operates on the down-draft principle of fresh air supply. When in use it is enclosed by heavy, fire-resistant canvas curtains, suspended from a folding metal framework. Over-spray is drawn through the grill in floor and exhausted outside the building by means of the Mahon Hydro-Filter process. When not in operation, curtains and framework are folded back and space is available for other purposes.

A Typical Example of How MAHON Finishing EQUIPMENT is engineered FOR UNUSUAL PLANT CONDITIONS

This company had a perplexing problem. They urgently needed a spray booth capable of handling an exceptionally large product. But, already overcrowded with war work, no space could be spared for its erection.

Mahon engineers were called in and surveyed the situtation. They selected a location convenient to the Drying Ovens (also Mahon installed) and designed and installed a Mahon Hydro-Filter, Down-Draft Spray Booth that efficiently functions whenever painting of the product is required—but that can be folded back out of the way when the space is needed for other purposes. Just another instance of Mahon co-operation—a typical example of how Mahon equipment can be designed and adapted to meet plant, product and operating conditions.

Whatever YOUR requirements may be Mahon engineers will supply equipment that will put your finishing operation on a faster, better and more economical basis.

Manufacturers of

Metal Cleaning Machines, Rust Proofing Machines, Hydro Filter Spray Booths, Ovens of All Types, Filtered Air Supply Units, Hydro Filtered Dust Collectors—and Many Other Units of Special Production Equipment—Including Complete Finishing Systems

THE R. C. MAHON CO. • DETROIT • CHICAGO

MAHON

Best —FOR ANY DEGREASER

Perm-A-Clor THE MOST HIGHLY STABILIZED SAFETY SOLVENT

★ Efficient, low cost degreasing is always assured when Perm-A-Clor is used as the solvent.

Perm-A-Clor is much more stable, both as a liquid and as a vapor, than ordinary solvents. Its resistance to decomposition by heat, or in the presence of metals or moisture is so high that it may be reused indefinitely.

It is extremely economical, since only small additions of solvent are required to compensate for natural vapor loss. It is a non-flammable chlorinated safety solvent.

A Detrex engineer will gladly acquaint you with the advantages of Perm-A-Clor for your degreasing operations . . . no obligation, of course.

SOLVENT DEGREASING and ALKALI CLEANING

DETROIT REX PRODUCTS COMPANY

13017 HILLVIEW AVENUE • DETROIT, MICHIGAN

Branch Offices In Principal Cities of U. S. A. —In Canada: Canadian Hanson & Van Winkle Co., Ltd., Toronto, Ontario